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REPORT OF THE TECHNICAL CONSULTATION ON HIGH SEAS FISHING

AND

THE PAPERS PRESENTED AT THE TECHNICAL CONSULTATION ON HIGH SEAS FISHING

Introductory note

This document contains the report of the FAO Technical Consultation on High Seas Fishing, held in Rome, 7-15 September 1992 and the scientific and technical papers prepared for it. The paper dealing with legal issues and some of the appendices to the report have not been reproduced.

The report of the Consultation and the papers prepared for it are being made available in accordance with General Assembly resolution 47/192.

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REPORT OF THE TECHNICAL CONSULTATION ON HIGH SEAS FISHING

Rome, 7-15 September 1992

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome 1992

PREPARATION OF THIS REPORT

This is the final report of the Technical Consultation on High Seas Fishing held at FAO Headquarters, Rome, 7-15 September 1992. The report was adopted by the Consultation on 15 September 1992.

ABSTRACT

The Technical Consultation on High Seas Fishing was held at FAO Headquarters, Rome, from 7 to 15 September 1992. The Consultation was organized in close cooperation with UN Division for Ocean Affairs and the Law of the Sea. The purpose of the Consultation was to obtain technical information to be used for the proper management of high seas fisheries. As such, it did not constitute the commencement of negotiations for a regime for high seas fisheries.

The Consultation addressed in plenary four thematic areas covering seven session topics. These were statistics and research; management (responsible fishing practices and new concepts and techniques); institutions and legal framework, and the participation of developing countries in high seas fishing. The Consultation formulated a number of recommendations for follow-up action by FAO.

Of particular significance was the endorsement by the Consultation that FAO should proceed with the elaboration of a code of conduct on responsible fishing, as called for in the Declaration of Cancún. The Consultation noted that the drafting of the code would take some time and it was possible that it would be elaborated in stages.

The Consultation requested the Committee on Fisheries to consider reviving the Sub-Committee on the Development of Cooperation with International Organizations in order to enhance cooperation and coordination between fishery bodies.

The Committee is invited to note the recommendations of the Consultation for FAO's attention, contained in Appendix F*.

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* Deleted in this version.

INTRODUCTION

1. The Consultation was held in FAO Headquarters, Rome, from 7 to 15 September 1992. Sixty-six Members were represented at the Consultation. In addition, three Non-Member States attended the Consultation as observers. Fifteen organizations also attended. The List of Delegates and Observers is attached hereto (Appendix B).[1]

OPENING OF THE SESSION

2. The Consultation was opened by Dr. W. Krone, Assistant Director-General a.i., Fisheries Department on behalf of the Director-General. Dr. Krone reviewed the international situation with respect to high seas fishing and outlined events leading to the convening of the Consultation. He stressed that the Consultation sought to obtain technical information necessary for possible high seas management measures, noting that it did not constitute the commencement of a negotiating process. Dr. Krone stated that FAO had cooperated closely with the United Nations Division for Ocean Affairs and Law of the Sea in preparing for the Consultation and would continue to do so in future on matters pertaining to high seas fishing. The full text of the opening statement is given in Appendix D.[2]

ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION

3. The Consultation adopted the agenda shown in Appendix A. The documents placed before the Consultation are listed in Appendix C. Country statements made available at the Consultation by Members are listed in Appendix E.[3]

4. A Drafting Committee was appointed comprising representatives of Angola, Argentina, Australia, Canada, Cape Verde, China, France, the Islamic Republic of Iran, Japan, Kenya, Mexico, Morocco, Norway, Papua New Guinea, Poland, United States of America, Uruguay and Venezuela. It elected Mr. Zbigniew S. Karnicki (Poland) as its Chairman and Mr. Jean-François Pulvenis (Venezuela) as Vice-Chairman.

ELECTION OF OFFICERS

5. Dr. Armin Lindquist, Assistant Director-General, National Board of Fisheries, Sweden, was elected Chairman.

6. Mr. Horacio M. Carandang, the Deputy Permanent Representative of the Philippines to FAO was elected Vice-Chairman.

7. Following the election of officers, the Chairman invited the Hon. Matthew C. Onyango Midika, M.P., Minister for Regional Development of Kenya, to address the Consultation. The Minister outlined aspects of fisheries development and policy in Kenya and urged cooperation between developed and developing countries in conservation and management of high seas resources for the benefit of mankind. He thanked FAO for assistance provided in the field of fisheries.

HIGH SEAS FISHING ISSUES

(a) Statistics

8. The Consultation agreed on the need for accurate and complete statistical reporting on fisheries in all waters particularly on the high seas fisheries, both for monitoring and evaluating high seas catches and as an essential instrument for research and fisheries management. While recognizing the need to adapt the present fishery statistical grids, it was stressed that such reporting should be compatible and consistent with existing established systems for collecting fisheries data so as not to interrupt the historical time series.

9. Although the Consultation considered that basic data requirements for catch and effort by fishing gear/method were essential for both research and management, it recognized that further studies were needed to determine the detailed requirements for the assessments of high seas stocks. In this connection, the scientific committees of international fishery commissions or other relevant regional bodies, as appropriate, where they exist, were considered the most appropriate bodies for identifying the types of data required. In other areas, FAO

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[1] In this version only a list of countries and organizations is given (Appendix A).

[2] In this version the opening statement is given in Appendix B.

[3] These Appendices are deleted in this version.

might take a lead to determine data requirements in consultation with States[1] fishing in the region.

10. The types of data to be collected would have to take into account their purpose, usefulness, cost, timeliness, burden in collection and collation, as well as regional differences. The Consultation agreed that reporting should ideally include data on catches of targeted species, incidental catches of other utilized species and discards by area and by gear.

11. It was recognized that any increased statistical reporting system would need the cooperation of fishing skippers to record such information, should take into account the time required for analysis of the data, and should be verified, where possible, at landing and processing points and/or through scientific observer schemes.

12. It was recognized that further information was required to allow evaluation of the impact of certain fishing activities on fish stocks, both on the high seas and in EEZs.

13. In the discussion on the identification of the appropriate detail for recording high seas catches, the advantages of using geographical references of latitude and longitude squares were noted. The importance of reporting on an oceanic and biological basis covering whole stock distributions was stressed. In this connection, the reporting by latitude and longitude squares would permit easy aggregation of data on a geographic/biological basis. The "box" principle was not considered appropriate for data collection, because of continuing changes to "box" boundaries, resulting from management actions.

14. The Consultation acknowledged that some of the information required for stock assessment purposes might be confidential. Protecting confidentiality is important for the cooperation of the fishing industry in the collection of data and such data should be collected, stored and published in a manner to maintain its confidentiality and meet stock assessment requirements. In this connection, it was proposed that FAO should undertake a survey to see how this information may be handled in order to meet both requirements.

15. There was general agreement that flag States should maintain a national register of fishing vessels capable of operating and/or authorized to operate on the high seas. This should include information on vessel capacity, power, gear employed, operating range and areas of operation. The establishment of an international or regional integration of national registers for fishing vessels was considered not to be a major requirement for statistical purposes, however, it was recognized that a list of authorized vessels could be an important element for fisheries management.

16. The Consultation appreciated the coordinating role of FAO in the collection and dissemination of aggregated data on world fisheries, and considered that FAO could, through the same mechanisms, coordinate the compilation of aggregated data on high seas fisheries. In this connection, the approach used to improve collaboration between the Atlantic regional fishery bodies, the Coordinating Working Party on Atlantic Fishery Statistics (CWP), was noted and its possible extension to other oceans recommended for further study, including modification of the STATLANT System.

(b) Research

17. The Consultation recognized that the last decade has seen a growth in fishing on high seas resources, as those within EEZs have been subject to progressively increasing exploitation. This trend is likely to continue given projected increase in world population and the need was expressed to improve or set up, where appropriate, management regimes for resources lying beyond the limits of EEZs. The resources exploited by high seas fisheries are not distributed homogeneously throughout oceanic areas, but are vulnerable to exploitation in limited areas of high production, which can be located using the technologically advanced equipment now available on fishing vessels.

1/ For the purpose of this Report the term "State" should, when appropriate, be read as including the European Community.

18. The Consultation placed major emphasis on the needs for management-oriented research as an integral part of the fisheries management process. The question of improved high seas fisheries research is seen as an important topic for follow-up of the Study on International Fishery Research (SIFR), and of UNCED. It was suggested the further development of priorities and procedures for high seas resources research could be profitably discussed in a technical meeting between ICES, PICES, FAO and other competent bodies.

19. The scientific criterion was accepted that straddling stocks[1/] and highly migratory species (as well as other stocks) need to be assessed in their entirety, based on data from the stock; including fisheries within both EEZs and high seas. Research questions are seen as intimately tied to fishery statistics, and unbiased information on all removals from a stock needs to be collected in a compatible fashion, together with appropriate biological and environmental data. Both statistics, and data on the biological characteristics of the stock (in particular information on size and species composition of the catches, and on by-catches) should be pooled in a common data base. The Consultation agreed on the need to help developing countries in setting up such data collection systems and data bases, and to assist and train their scientists in data collection and analysis within an ecosystem management perspective. It was suggested that FAO should be involved in this activity.

20. Mechanisms for involving scientists in this assessment process from both coastal states and distant water fishing nations (DWFNs) exploiting the same resource will need to be developed where they do not exist, given that there is agreement that scientific criteria for assessment should be rigorously applied. Several regional bodies have already begun to consider how this requirement could be implemented, and there was a request for FAO to assist in setting up a consultative resource assessment mechanism to advise on the management of the South East Pacific jack mackerel stock.

21. The development of data bases for integrating information on high seas resources could be addressed by a High-Seas Geographical Information System, which could be linked to similar data bases for information on high seas environments, such as GOOS (Global Ocean Observing System) being developed and implemented by the Intergovernmental Oceanographic Commission (IOC).

22. The importance of capturing on this data base, information at a low level of spatial and temporal aggregation was emphasised, recognizing that this will be a requirement in considering management measures based on seasonal and area closures. This geographical breakdown will be needed in order to distinguish catches and other information pertaining to different stocks. At the same time, there is a need to maintain the confidentiality of individual records. Such data bases are already being implemented in some regions by fisheries commissions and similar bodies and cooperation between these bodies is desirable. It was suggested that FAO examine the feasibility of developing standard data collection and reporting formats compatible between regions.

23. The need for a 'layered' approach to data collection was noted by the Consultation: (1) the minimum level of data required for stock assessment is still seen to be catch and effort data, and countries fishing high seas resources were urged to ensure that these data are collected in an accurate and compatible manner; (2) biological data are needed to ensure that population models can be formulated; (3) ecosystem data should include collection of adequate data on by-catch species, and (4) should be supplemented by environmental data.

24. Area/season 'windows' (periods and areas where fishing is permitted within wider closed areas), and 'boxes' (areas and seasons where fishing is closed within a wider open fishing area) have been used. The research requirement underlying this type of measure is better knowledge of critical ocean habitats, spawning and nursery areas for key stocks, and a knowledge of the oceanographic conditions characterising these areas, and the ecological communities occupying them.

[1/] For the purpose of this Report the term "straddling stocks" should be understood as stocks which occur both within EEZs and in an area beyond and adjacent to it, as described in Art. 63, para.2 of the UNCLOS.

25. The use of transponders monitoring fishing location was seen as an important component of data collection systems, but there was a need for training, cost evaluation and broader information dispersal on these systems. It was recommended that FAO and countries where this technology is being applied, provide information on these aspects to interested countries and organizations.

26. Carrying out research on high seas components of straddling stocks and highly migratory species from research vessels was recognized as being in most cases significantly more costly than for similar research within EEZs. This high cost would pose a particular problem for developing countries, which in general do not have or are just beginning to implement research mechanisms for stocks within their EEZs.

27. The Consultation, however, agreed that a great deal of useful research can be carried out with the cooperation of fishing enterprises. This cooperation will be fostered by explaining the objectives of the research and the benefits accruing to the fishing enterprise concerned from sustainable resource management. Special data on life histories, tagging and migration as well as on the genetic make-up of stocks can be obtained from carefully collected and identified commercial catch samples.

28. High priority was attached to the validation of data on catch, effort and by-catch, given that misreporting of commercial data has been seen as a factor leading to errors in scientific assessments. Three mechanisms were given prominence in providing for data validation: the use of observers, the use of auxiliary data from landing and processing points, and technical innovations such as satellite transponders to provide unambiguous information on location and other fishing parameters. Which of these mechanisms for data verification is appropriate varies and depends on the specific application, and was seen as depending on the financial and technical resources of the country concerned.

29. The Consultation considered the UNCLOS criterion of what constitutes 'the best scientific information available' as the basis for management. Data necessary for stock assessment are being collected for straddling and high seas resources in the North Atlantic and Pacific, and for a number of resources throughout the world's oceans. The level of data for many other resources, however, such as squids, smaller tuna stocks, sharks and billfish are not adequate to assess the status of these stocks, or their state of exploitation, although concern as to the deterioration of stock condition of several of these resources has been expressed. At the same time, it was recognized that it has not always been a lack of data, but the lack of appropriate management action, that has led to stock decline.

30. It was recognized that scientific assessments with a high degree of uncertainty could lead to the setting of "pre-preemptive" TACs, or in the extreme case, to closures of fishing operations, such as has been implemented in the case of the large whale resources and the high seas drift net fishery. Such preemptive closures are seen as a last resort, but should provide an incentive for ensuring that accurate fisheries data are gathered and exchanged between all concerned with management of the high seas resource.

31. The Consultation discussed the question of funding for high seas research and noted that DWFNs and coastal States would both benefit from funding the necessary data collection in the case of straddling stocks and highly migratory species, and it was agreed that the cost of research should be shared. The Consultation pointed out the danger that inadequate funding of research would result in weak assessments.

32. The Consultation gave weight to the need for sharing of scientific information and a general view was expressed that existing regional mechanisms and organizations should be reinforced and the search for proper funding for research should be facilitated. Sharing of information between regions was seen as valuable, where there is a wide range of operations of DWFN fleets and a wide distribution of the fishery resources concerned.

33. The Consultation noted the limited information available on the economic aspects of high seas fishing. Given the general level of overcapacity of world fleets and the higher costs presumed for these operations, the profit margins may be relatively low. The need for a study of these questions, including economic returns, possible subsidies, and forward and backward linked industries, was recognized.

(c) Management: Responsible Fishing Practices

34. The Consultation endorsed the request set out in the Declaration of Cancún for FAO to draft a code of conduct on responsible fishing and to do so in consultation with other international organizations. It recommended that in drafting a code of conduct the outcome of the UNCED should be taken into account.

35. In the discussions on the scope of application of a code of conduct on responsible fishing, it was suggested that responsible practices should be followed in all fisheries. There was, however, reservation expressed with respect to a Consultation on High Seas Fishing appearing to recommend a code of conduct with regard to fisheries in EEZs.

36. The Consultation took note of the explanation given by the Secretariat in relation to the scope of the Declaration of Cancún which does not limit its recommendations to the high seas. It also noted that a comprehensive code of conduct could be used as guidelines by all States, in all fisheries.

37. Therefore, it was acknowledged that with due regard to the rights and obligations of States under UNCLOS, a code of conduct might apply in all fisheries and might constitute a tool to help States ensure better responsible fishing practices.

38. It was agreed that the purpose of a code of conduct is to provide standards for responsible fishing and guidelines for their implementation and that these should be as complete as possible. The code of conduct might address, inter alia, marking of vessels and fishing gear, standards of fishing operations, guidelines and operational procedures for MCS, guidelines on the development of new fisheries, settlement of disputes, mechanisms to prevent "flagging out" of vessels to avoid complying with agreed conservation measures, and fair trade practices. It was also suggested that sound management practices might be an appropriate part of the code of conduct.

39. The importance of coordination with other relevant international organizations was stressed to ensure that the code would correctly reflect, as appropriate, the provisions of international conventions and other legal instruments, particularly those related to conservation of living resources, fishing operations and fisheries management.

40. The Consultation identified the following elements that should be considered in the preparation of a code of conduct. These were to:

(a) promote research leading to a better understanding of high seas and other stocks and to ensure sustainable development through responsible management practices and fishing operations.

(b) abide by standards developed in conformity with international law to control vessels, nationals (as provided for in Art.117 of UNCLOS), and to monitor their fishing activities.

(c) deal with the management of stocks and regulate fishing effort on the high seas through international cooperation, as provided for in Arts. 63(2), 64-67 and 118 of UNCLOS, with particular attention to problems of overfishing and overcapacity in fishing effort on the high seas.

(d) undertake to supply data to relevant regional bodies and to contribute, as appropriate, towards regionally organized MCS.

(e) consider the development of appropriate procedures for settlement of disputes.

(f) "that tariff and non-tariff barriers affect international trade in fish products and rational utilization of fisheries resources and that, in this regard, there is a need to reach agreement on measures to promote international trade in fish products consistent with the negotiations taking place in the Uruguay Round of the GATT, general principles of the GATT and the principles of responsible fishing."

41. The Consultation noted that the development of a full code of conduct would take time and noted that parts of the code could be elaborated in stages.

42. In this respect, the Consultation agreed that there is a need for urgent action to address the problem of reflagging of fishing vessels as a means of avoiding compliance with applicable conservation and management rules for fishing activities on the high seas, consistent with the decisions of UNCED, and recognized the need for an international framework to effectively deter such reflagging.

43. In the discussions on this issue, due note was taken of the fact that transfer of vessels to flags of convenience is not confined to fishing vessels and that the general issue was being addressed by UNCTAD. The Consultation was advised by the Secretariat that IMO was also greatly concerned with regard to matters of safety and protection of the marine environment, and ILO regarding conditions of work and service in the fishing industry; the latter was also stressed as being of great concern by the Consultation.

44. The Consultation took note that in reflagging, the laws of the new flag State should effectively apply to the vessel, as provided in UNCLOS, to deter their nationals from engaging in such activity to evade the conservation and management measures. It was underlined that most, if not all, of the accommodating States are members of international organizations such as FAO, IMO and ILO, as well as fisheries bodies. In this connection, it was mentioned that States and organizations should exchange information in this respect.

45. The Consultation requested the Secretariat to bring this issue to the Committee on Fisheries for it to consider means through which an international agreement could be reached as quickly as possible to prevent reflagging of fishing vessels for the purpose of non-compliance with conservation and management measures for high seas fisheries.

46. The Consultation stressed the need for States to comply with their duty to ensure that their nationals are held accountable for their activities on the high seas with regard to the conservation of the living resources of the high seas as provided for in Art. 117 of UNCLOS.

47. The Consultation stressed the need to develop data bases on a Regional and/or a Global basis to record those vessels authorized by the flag State to fish on the high seas. It was noted that such data bases could provide useful information, with respect to catching capacity and fishing effort in high seas areas.

48. The Consultation recognized the desirability of using regionally integrated satellite surveillance, which could be useful for gathering relevant scientific data and the furtherance of MCS in the management of high seas fisheries. The procedure of how these data can be managed needs to be elaborated further. Concern was raised at the cost of such technology, but the view was expressed that the cost compared very favourably with conventional means of MCS on the high seas. However, this issue should be studied further and subject to cost/benefit analysis. The cost of fitting transponders on high seas fishing vessels was said to be small compared to the total amount invested and the daily running cost did not add significantly to overall costs to the vessel.

49. It was agreed that the provision of such systems would require training for MCS officers and administrations, particularly with regard to the new technologies used and the special conditions pertaining to the high seas, but that the technologies were not difficult to learn and use. This was particularly pertinent to developing countries.

50. The Consultation noted the proposal, in the Declaration of Cancún, that "States should promote the development and use of selective fishing gear and practices that minimize waste of catch of target species and minimize by-catch of non-target species". In this respect, it was recognized that there could be conflict between strategies for reducing waste and unintentional by-catch and achieving commercial efficiency of fishing operations.

51. In this regard, the Consultation also took note of action taken and the progress made in reducing the incidental mortality of dolphins, in the framework of rational exploitation of tuna resources in the Eastern Pacific through the use of appropriate fishing gear and manoeuvres.

52. The Consultation noted with appreciation that considerable progress had been made over the last 25 years in gear selectivity research as demonstrated at the ICES Symposium on Fish Behaviour in Relation to Fishing Operations, held in Bergen

in June 1992. It was stressed that higher priority than in the past should be given to relevant research, promoting fishing gear and methods that are environmentally sound. Such developments may reduce the need for current and future moratoria of certain fishing activities.

(d) Management: New Concepts and Techniques

(i) Basic concepts

53. The Consultation agreed that the management of high seas fisheries shall be undertaken within the framework of UNCLOS and in agreement with its relevant provisions. The Consultation identified the following concepts that should be considered:

- Management of high seas fishing should be improved, and take into account existing arrangements as well as the rights and obligations of all States on the high seas, and be subject to the rights, duties and interests of coastal States in their EEZs, as provided for by UNCLOS.
- High seas fisheries management should be in accordance with the concept of sustainable development as defined by the FAO Council in November 1988 and reflected in the outcome of UNCED and Art. 119 of UNCLOS.
- Management of fisheries in the high seas should be conducted in accordance with the concept of responsible fishing that, as stated in the Declaration of Cancún, "encompasses the sustainable utilization of fisheries resources in harmony within the environment; the use of capture and aquaculture practices which are not harmful to ecosystems, resources or their quality; the incorporation of added value to such products through transformation processes meeting the required sanitary standards; the conduct of commercial practices so as to provide consumers access to good quality products".
- All States should exercise control over the activities of their vessels and nationals on the high seas in order to ensure compliance with agreed conservation measures as provided for in Art. 117 of UNCLOS.
- To be effective, fisheries management should be concerned with the whole stock unit in its entire area of distribution, and take into account all sources of removals. In the case of fish stocks that occur both within the EEZ of one or more States and the adjacent high seas, or fish stocks entirely located in the high seas, management measures should be harmonized between the States involved, and also, where appropriate, through relevant regional and sub-regional fisheries management bodies, within the framework of UNCLOS.
- A set of internationally agreed standards and minimum requirements for high seas fishing should be developed. In this respect, the problems of transfer of flags to "flags of convenience" should be given priority attention.
- Consumers' interests should be duly taken into account when designing management measures.
- Management arrangements for high seas fisheries should take into account, *inter alia*, the particular characteristics of each region and other relevant factors.

(ii) Control of fishing effort

54. The Consultation noted management problems in certain areas of the high seas, including overcapacity and resultant overfishing.

55. It was recognized that the access to timely and reliable information on the amount of fishing effort and its geographical distribution was essential for the management of fisheries in the high seas. In this respect, the Consultation noted the merits of observer programmes for high seas fisheries. It was also noted that there is a potential for integrated satellite data transmission systems able to

provide timely and reliable data on the position and operation of vessels on the high seas.

(iii) Management reference points

56. The Consultation agreed that the concept of maximum sustainable yield continued to provide a valid reference point for management. It was, however, recognized that it was necessary to continue to further examine other reference points to deal with economic, multispecies and ecosystem management strategies.

(iv) Cooperation in management

57. It was deemed essential that States whose nationals exploit identical living resources, or different living resources in the same area should coordinate and combine efforts not only in data collection and research but also in monitoring, control, surveillance and enforcement on the high seas.

58. Guidance is required on how to proceed when a flag State does not or cannot fulfil its responsibility, with particular reference to flags of convenience.

59. Cooperation between States fishing in the high seas should take place in accordance with the relevant Articles of UNCLOS. Flag States not party to a management arrangement whose vessels wish to start fishing within the management area should seek to cooperate, where appropriate, with States involved in the management arrangement, as provided for in the relevant Articles of UNCLOS. Such cooperation should be facilitated, if required, through FAO's good offices, and by the exchange of fishery data and information.

60. The Consultation noted that need for, and the role of, international cooperation in management may vary from stock to stock and from one region to another.

61. It was suggested that further analysis was required to determine the nature and extent of the impact on resources within the EEZs of fishing in the high seas and vice-versa, where appropriate.

(v) Environmental issues

62. The Consultation stressed the fact that all fish (including the target and by-catch species) should be considered both as resources and as part of the ecosystem and, as such, should be duly protected from long term or irreversible damage and taken into account in management programmes.

63. However, the Consultation noted its concern that some actions taken solely for the protection of the environment could have possible negative social and economic consequences and could jeopardize the rational use of living resources. The Consultation took note of paragraph 119 of Chapter 17 of Agenda 21 concerning unilateral actions and expressed its preference for multilateral action, if necessary, for the protection of the environment.

64. It was recognized that since fishing was, in essence, a harvesting activity of renewable resources, it had inevitable impacts on the renewable resources and their environment (including non-target species). It is therefore recognized that fishing should be conducted in a responsible way to ensure its sustainability.

65. In this respect, it was also recognized that acceptable levels of impacts, to be agreed upon, would need to be based on scientific evidence in conformity with concepts of sustainable development.

(vi) Precautionary management

66. Taking note of the precautionary approach recommended at UNCED, the Consultation agreed that fisheries should be managed in a cautious manner. However, the Consultation noted that while overharvesting of renewable resources can have serious consequences on fisheries populations and ocean ecosystems, it is fundamentally different from damaging practices like toxic waste dumping and industrial poisoning, for which the precautionary principle was created. The Consultation stressed that precautionary management does not necessarily require a moratorium on fishing.

67. Caution in dealing with this issue was recommended, stressing the need to identify appropriate methods to handle uncertainties in assessments so as to safeguard peoples' livelihoods and to maintain biodiversity. The practical implications of precautionary management would have to be carefully examined to avoid unnecessarily restrictive measures. In addition, the relevant precautionary measures and practices currently applied in relation to living marine resources should be identified and, if valid, be reflected as appropriate in the code of conduct.

68. It was stressed that management decisions should be based on the best scientific information available as provided for in UNCLOS, and it was underlined that non-discriminatory measures with a clear scientific basis were seen as more legitimate by fishermen and, as such, had more chances to be respected by them.

69. The Consultation stressed that precautionary management measures taken in the absence of sufficient scientific data, should be revised or revoked as appropriate, when new information became available.

(vii) Other issues

70. The Consultation noted that more transparency was required in high seas fisheries management decisions. It also noted that the public should have access to better information on high seas fishing in order that its growing participation and influence in fisheries management matters is based on sound and unbiased information.

71. The Consultation noted that trans-shipments at sea could have the potential to increase fishing effort. Unregulated trans-shipment could have detrimental consequences and its impact should be investigated further.

72. Allocation was recognized as a major issue in management of high seas fisheries. In this respect the Consultation noted that there were difficult issues to be addressed in balancing the rights of all States to participate in high seas fisheries with the need to manage such fishing activity so as to ensure long-term sustainable production.

73. The effects of global climate change and its oceanic consequences (changes in sea level, water temperature, current strength and location, river flow regimes, UV radiation etc.) may affect high seas resources in highly dynamic ocean areas and for high seas stocks with a coastal component in their life cycle. Cooperative efforts should therefore be made by all States concerned and relevant international agencies to analyze their influence consistent with Chapter 17 of Agenda 21.

74. The Consultation noted the need for more effective procedures for dispute settlement in relation to some high seas fisheries.

(e) Institutions

(i) Need for and effectiveness of international fisheries bodies

75. The Consultation agreed that there was a need for regional and sub-regional international fisheries bodies to provide the institutional mechanisms necessary to achieve effective high seas fisheries management. The Consultation noted that while success had been achieved by some regional fisheries management bodies, others may need to review their structures and operations to improve the management of high seas fishing. However, it was stressed that, in general, fisheries management could be enhanced with an aim to ensure sustainable use of the resources.

(ii) Membership and participation in regional fisheries bodies

76. In strengthening existing regional fisheries bodies and in the creation of new ones, the Consultation recognized the need of compliance with the provisions of UNCLOS. It was suggested that membership of international fisheries management bodies should be open to all States referred to in the relevant Articles of UNCLOS. Furthermore, there was general agreement that these States should belong to and participate in the work of these bodies. There are also regional and sub-regional fishery bodies which serve the function of coordination among interested coastal States, without prejudice to Article 118 of UNCLOS.

(iii) Non-contracting parties

77. The Consultation noted, however, that many fisheries bodies have experienced difficulties in dealing with non-contracting parties. In this regard, the Consultation noted some successes achieved by a number of organizations in dealing with this problem. There was general agreement, however, that in many cases participation in the work of regional fisheries bodies would be enhanced through the provision of financial and technical assistance.

(iv) New entrants

78. The Consultation noted, that as a general principle, all States have the right as provided by UNCLOS, to participate in any high seas fishing. There was agreement, however, that in some situations a number of problems may exist concerning the entry of new States into a fishery, especially when the resources are already fully utilized. While some problems are likely to be common to a number of fisheries, others may be particular to specific situations. It was noted, therefore, that in some cases entry would have to be regulated by agreed guidelines.

(v) Conditions for the effectiveness of regional fisheries bodies

79. The Consultation emphasized that the effectiveness of regional fisheries bodies and hence their ability to manage high seas fisheries on a sustainable basis was dependent upon the political will of the States concerned. In particular, the effectiveness of organizations was highly dependent on adequate funding and the enforcement by flag States of management decisions and the provision of adequate and accurate data.

(vi) Differences between international fisheries bodies

80. It was acknowledged that the structure and specific areas of competence of the regional fisheries organizations were influenced by differing geographical, biological, political and economic circumstances. It was acknowledged, therefore, that regional fisheries organizations would vary from one to another. The Consultation agreed, however, that common to all regional fisheries bodies was the need for them to be able to meet different requirements and changing circumstances.

(vii) Relationship between coastal States and regional fisheries bodies

81. The Consultation considered the issue of the relative roles of coastal States' jurisdiction within their EEZs and the area covered by a fisheries body on the adjacent high seas. There was general agreement that the management measures of a fisheries body should attempt to achieve consistency between conservation measures in EEZs and in adjacent areas, consistent with the provisions of UNCLOS.

(viii) Cooperation and coordination

82. The Consultation noted that some form of cooperation and coordination between fisheries bodies would be desirable in order to avoid duplication of work, to share statistics and information and to effect transfers of expertise and technology. The Consultation further noted that consideration should be given to reviving the COFI Sub-Committee on the Development of Cooperation with International Organizations to assist regional fisheries organizations in this task.

(ix) Accountability and responsibilities of regional fisheries bodies

83. The idea of setting up an international high seas fisheries management authority to which the individual bodies would be responsible received many reservations and the Consultation recognized that this was an issue that lay outside its competence. The Consultation acknowledged that regional fisheries bodies were responsible to their members.

(x) Financing

84. There was a general view that it would be neither practical nor appropriate for regional fisheries bodies to be financed either wholly or in part by fines imposed by flag States for breaches of regulations. Instead there was a broad measure of agreement that although regional fisheries organizations should be financed as a general rule, by contributions from member States, complementary

financing might be explored, including the possibility of funding specific programmes and activities through contribution by the private sector.

(xi) Role of flag States

85. The importance of the responsibility of flag States in implementing decisions of the fisheries bodies was further reinforced. Emphasis was given by the Consultation to the role of flag States in providing data required for management decisions and in carrying out monitoring, control and surveillance as essential elements of flag State responsibility. In this context, there was considerable support for the view that the use of satellite surveillance and monitoring systems should be encouraged.

86. It was noted that while the placing of scientific observers on board vessels should not be intended as a policing measure, it frequently did enhance the monitoring of compliance with regulations. The Consultation noted that enforcement of regulations should be reinforced by inspection of vessels by the flag States, as well as joint or cooperative inspection and enforcement measures agreed by members of a fisheries management body, where appropriate.

(xii) Management decisions

87. The view was expressed that consensus agreement on management measures, although often resulting in slow progress, was most likely to result in commitment by the members.

(xiii) Settlement of disputes

88. The Consultation noted that most fisheries bodies do not have clearly defined dispute settlement provisions, and that it might be desirable for the members of such bodies to undertake to remedy that situation, as appropriate. It was suggested that fisheries bodies could, *inter alia*, examine dispute settlement procedures established in other fields of international cooperation.

(f) Participation of Developing Countries in High Seas Fishing

89. The Consultation recognized that at present only few developing countries were involved in high seas fishing operations but that others might wish to commence such fisheries in the future, particularly for tuna. It noted some countries had to overcome constraints in their participation in high seas fishing such as lack of technology and capital, competition from existing fleets and access to markets, including tariff and non-tariff barriers. Other countries were already in a position to move into high seas fishing in the near future. In addition, it was observed that, as certain developed countries found it difficult to maintain profitability by fishing in distant waters, there were opportunities for certain developing countries to take advantage of their proximity to the resource and to expand their operations for exploiting the high seas fisheries.

90. With regard to access to high seas fishery resources, the Consultation noted that reasonable access would need to be given to developing States as new entrants without discrimination in accordance with the provisions of UNCLOS. It was considered that allocation of high seas resources be examined on a region by region or stock by stock basis and be subject to an agreement of all States concerned. There was a need to balance a requirement to allow non-discriminatory access with a need to ensure conservation and management of high seas stocks. It was further recommended that monitoring, control and surveillance of high seas fishing activities should be intensified.

91. The Consultation agreed that research needed to be added to education and training, infrastructure, and strengthening of planning capabilities, as areas requiring major technical and financial support. The research should be linked above all to improved stock assessment and resource management. The special contribution of Norway in this field, through the work of the Fishery Research Vessel DR. FRIDTJOF NANSEN, as part of an FAO/UNDP activity as well as technical cooperation programmes of other donor agencies were well appreciated.

92. The Consultation suggested that regional and international cooperation was an important factor to greater involvement of developing countries in exploitation of the high seas. Developed countries could continue to help this process through

bilateral and multilateral aid programmes in the form of training, provision of technical assistance, capital aid and transfer of technology in general.

93. Concern was expressed about the risks involved in transfer of inappropriate technologies to developing countries wishing to carry out high seas fishing in a responsible manner. In this connection economically viable joint ventures and partnerships, between entities and businesses in developing countries and entities from developed countries that have experience in high seas fishing were seen as one of the appropriate solutions.

94. There was discussion on the advantages and disadvantages of subsidies and low cost loans to develop fisheries and certain countries described how these had been used to build up their fleets at an early stage in the development process. However, it was noted that over-capitalization of the fishery was often caused by subsidies beyond the initial development stage, leading to over-fishing and economic losses, and that this should be discouraged.

95. A number of small States might not be able to participate in high seas fishing in the near future because of their socio-economic conditions. These States could promote, as appropriate, increased employment on distant-water vessels which had been permitted licensed access to their EEZ in order to improve fishing skills and also seek to obtain benefits from enhanced cooperation in fisheries as well as the provision of local trans-shipment, port and other services.

96. The Consultation noted the special requirements of developing countries as referred to in Article 119 of UNCLOS. It stressed particularly the situation of small island countries with a high economic dependency on fisheries and the ocean in general, coastal States with a high potential to exploit highly migratory fishery resources, and countries with a high demand for fish and fishery products due to large populations and fish eating traditions. FAO was requested to undertake a special programme of assistance to such developing countries as part of a global effort to secure greater food supplies and food security as well as to promote responsible fishing.

97. The Consultation noted the provisions of the Cancún Declaration with regard to greater financial support for investments by developing countries and the Agenda 21 of UNCED with special reference to resource sustainability, development of human resources and capacity building of countries to fully participate in fisheries research, development and management.

98. The Consultation noted the importance of international trade in fish products and the need for developing countries to have access to markets in developing as well as developed countries. In this connection it noted paragraph V of the Cancún Declaration which states:

> "That tariff and non-tariff barriers affect international trade in fish products and rational utilization of fisheries resources and that, in this regard, there is a need to reach agreement on measures to promote international trade in fish products consistent with the negotiations taking place in the Uruguay Round of the GATT, general principles of the GATT and the principles of responsible fishing;".

(g) Legal Framework

99. The Consultation took note of the papers which had been presented to the meeting under agenda item 8. These were: Legal Issues Concerning High Seas Fishing (FI/HSF/TC/92/8), and The Law of the Sea the Regime for High Seas Fisheries: Status and Prospects, which had been prepared by the Division of Ocean Affairs and the Law of the Sea, UN New York. It was noted that these papers provided a comprehensive overview of the legal issues concerning high seas fishing which would serve as a useful basis for consideration of these issues in the forthcoming intergovernmental conference as decided at UNCED. It was also agreed that the contents of these papers should be further studied and analyzed, and that they contained a useful inventory of issues still awaiting legal attention. However, this did not imply acceptance of or agreement with the various points of view expressed in them.

100. The Consultation further noted that it was not appropriate to engage in discussions on the legal issues concerning high seas fishing at this Consultation both because of the complexity and number of issues raised, and the need to avoid pre-empting the forthcoming United Nations intergovernmental conference to be held.

101. The Consultation also recommended that there should be a full participation of developing countries in the intergovernmental conference and noted the desirability of practical provisions which should be made through international organizations to ensure such participation.

102. The Consultation reiterated the need for a code of conduct to be prepared on the basis of technical and scientific work undertaken by FAO.

ADOPTION OF THE REPORT

103. This Report was adopted on 15 September 1992.

APPENDIX A

LIST OF COUNTRIES AND ORGANIZATIONS

Algeria
Angola
Argentina
Australia
Belgium
Brazil
Canada
Cape Verde
Chile
China
Colombia
Cook Islands
Costa Rica
Cuba
Cyprus
Denmark
Ecuador
Egypt
El Salvador
European Economic Community
Fiji
France
Germany
Ghana
Greece
Guatemala
Guinea
Honduras
Iceland
India
Indonesia
Iran (Islamic Republic of)
Iraq
Italy
Japan
Kenya
Libyan Arab Jamahiriya
Madagascar
Malaysia
Mexico
Morocco
Netherlands
New Zealand
Norway
Papua New Guinea
Peru
Philippines
Poland
Portugal
Republic of Korea
Samoa
Saudi Arabia
Seychelles
Spain
Sri Lanka
Sudan
Sweden
Thailand
Tonga
United Kingdom of Great Britain and Northern Ireland
United States of America
United Republic of Tanzania
Uruguay
Vanuatu
Venezuela
Yemen

OBSERVERS FROM UNITED NATIONS MEMBER STATES

Marshall Islands

Russian Federation

Ukraine

UNITED NATIONS AND SPECIALIZED AGENCIES

Intergovernmental Oceanographic Commission

INTER-GOVERNMENTAL ORGANIZATIONS

Commission for the Conservation of Antarctic Marine Living Resources

Inter-American Tropical Tuna Commission

International Commission for the Conservation of Atlantic Tunas

International Council for the Exploration of the Sea

International Whaling Commission

Latin American Organization for Fisheries Development (OLDEPESCA)

Organisation for Economic Cooperation and Development

Permanent South Pacific Commission

Southeast Asian Fisheries Development Centre

South Pacific Commission

South Pacific Forum Fisheries Agency

NON-GOVERNMENTAL ORGANIZATIONS

Greenpeace International

International Federation of Women in Legal Careers

World Wide Fund for Nature

APPENDIX B

OPENING STATEMENT BY THE REPRESENTATIVE OF THE DIRECTOR-GENERAL OF FAO

Good morning distinguished delegates and observers, ladies and gentlemen.

On behalf of the Director-General of FAO, welcome to FAO Headquarters and to this Technical Consultation on High Seas Fishing.

Ten years ago the United Nations Convention on the Law of the Sea (UNCLOS) was adopted. At that time UNCLOS meant the end of the era of freedom of fishing within 200 nautical miles, where 95 percent of the fishery resources were estimated to be found. The new era promised expectations for rational management and conservation of living marine resources and a retrenchment of fishing fleets.

Now, a decade later, a review of the situation indicates that the size of the world's fishing fleet has continued to increase at a rate estimated to be twice the increase of marine catches. This fleet now has enormous proportions. Its actual replacement value is estimated at around 300 billion dollars. A reasonable return to capital would consume almost one half of the total annual revenue from marine fishing. But current landed values of marine fisheries do not even cover the operating costs, let alone some interest on the capital invested.

In most regions the plateaux of fish production had already been reached in the early 1980's. Since then production increases have mostly consisted of small pelagic species, subject as we know, to large year-to-year fluctuations. The major demersal stocks are over-exploited, if not biologically, certainly economically. It is now an undisputed fact that the overall fishing pressure can no longer be regarded as sustainable. It is also clear that reduction in fishing capacity is a must. If properly managed, marine fisheries would not only render greater physical yields, that means more food, they would also become enormously profitable.

This is a problem of international concern. While our deliberations here will be focused on the high seas, we must see the problems in the wider context of world fisheries because they are not just on the high seas. Currently, it is estimated that 8 to 10 percent of the marine fish catches are taken in high seas areas - a relatively small share of overall production. The problem of over-capacities concerns virtually all fisheries but they are particularly felt on the high seas, because it is there where surplus capacities tend to move when there is no other opportunity. Moreover, many of the fish stocks targetted on the high seas are of high value and many of them straddle or migrate through coastal States' Exclusive Economic Zones.

The driving force behind the expansion in high seas fishing has of course been the constraints in the supply of fish in face of increasing demand from population increases and higher incomes. It is the search for food.

Under these conditions governments have difficulties in exercising the required control over fishing to ensure sustainability. In fact, as in agriculture, significant subsidies have been provided to guarantee and to promote continuation in food supplies from the sea. While management of fisheries within national jurisdictions has not always been effective; for the high seas there is not even an adequate mechanism for management. International fishery commissions do not have the capacity to make binding decisions concerning management, and there are significant areas in some oceans that have no such commissions at all.

In the last few years the problems associated with high seas fishing have reached international prominence, primarily because of concerns that marine fishery resources are not exploited in a sustainable manner, and that unacceptable and irreversible environmental damage could occur.

FAO has recognized the extent and depth of international concern for high seas fisheries management and first addressed the issue in the context of drift-net fishing. As a consequence of FAO's contribution to the debate on the use of large-scale pelagic drift-nets and its role in helping to resolve the difficulties that had developed, the FAO Council directed that we should continue to focus attention on broader issues associated with high seas fishing. It was envisaged that this

Consultation would be followed by an inter-governmental consultation, to establish appropriate mechanisms for the management of high seas fisheries.

With the UNCED Summit in Rio de Janeiro in June this year, in its Agenda 21, the need for an inter-governmental conference under United Nations auspices, has been confirmed. This Technical Consultation should therefore be seen as a preparatory and hopefully contributory step towards the holding of that conference, where internationally agreed mechanisms must be obtained for the management of high seas fisheries.

Ladies and Gentlemen, let me make it quite clear, this Consultation has the objective of obtaining technical information necessary for identifying possible measures for appropriate management of high seas fisheries. It is not the start of a negotiating process to change the "rules of the game"; that must come later! You are here to discuss and analyse objectively the main issues and perhaps come up with some first ideas for solving them.

Information required should cover all relevant aspects of high seas fishing and fisheries management as proposed in our Draft Agenda: statistics, research, fishing operations, management concepts, institution and legal aspects, as well as the participation of developing countries in these fisheries. We feel strongly that such a technical meeting must address all these matters. How could we, for instance, leave the existing legal framework aside, when we will have to talk of possible options for ensuring compliance with management measures, such as inspection and international observation programmes? Should the tasks of observation and information be left to Non-Governmental Organizations, as is presently happening in the Mediterranean? We should be prepared to table all facts and figures and to identify possible solutions to the issues we are facing.

The Agenda for this Consultation has been elaborated, taking into account the views of a number of countries. In recognition of the role that the United Nation's Division of Ocean Affairs and Law of the Sea (DOALOS) will play in the further deliberation on the legal framework for high seas fishing, FAO has cooperated closely with that Division in preparing for this Consultation. This close collaboration will continue as issues are further elaborated and addressed and as the recommendations of UNCED are implemented under the auspices of the United Nations. During this process FAO will continue to contribute substantially to technical and scientific discussion on high seas fishing.

Discussion at this Consultation will be wide-ranging and controversial but we hope that your deliberations will help to improve understanding of high seas issues without prejudicing the UNCED Inter-Governmental Conference.

It was most timely that in parallel to the international discussions on high seas fishing and the UNCED preparatory process the Government of Mexico took the initiative to convene an international conference on responsible fishing, which was held in Cancun in May this year. This conference put a number of international fishery issues into perspective. It clearly underlined the inter-relationship of international fisheries and trade issues. It called for a code of conduct for resposible fishing, not just for the high seas, but everywhere. It has asked that the next decade be dedicated to responsible fishing. The "Declaration of Cancún" will provide a lot of guidance in the further discussions on international fishery issues, in which FAO has been asked to play a leading role.

We are extremely pleased to see so many delegations from Members and the international and regional governmental and non-governmental organizations. The comments and contributions we have already received demonstrate your interest and commitment. Your contributions are most appreciated.

An international adoption of mechanisms for the management of high seas fishing within the overall legal framework established in UNCLOS will not be an easy task. Moreover, the complex nature of issues and the divergent interests of countries, is unlikely to permit a quick solution. I am confident however, that with goodwill, reason and carefully considered positions and arguments, countries will be able to fully recognize all issues that presently impede effective management and in turn the sustainability of the living marine resources of the high seas. At the back of our minds, all of us must be aware of the disastrous effects over-exploitation of fishery resources has had on coastal communities and small scale operators, who are often living at the very margin of subsistence. It is their fate which should govern our considerations.

Thank you for your attention.

PAPERS PRESENTED
AT THE
TECHNICAL CONSULTATION ON HIGH SEAS FISHING

Rome, 7-15 September 1992

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, 1992

PREPARATION OF THIS REPORT

This supplement to the Report of the Technical Consultation on High Seas Fishing, held in Rome from 7-15 September 1992, contains the papers prepared by the Secretariat for the Consultation, and they are presented as submitted.

It should be pointed out that they were drafted in advance of the conclusions and recommendations of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992. Moreover, it is stressed that the papers do not reflect the opinion of any FAO Member or Organization at the Technical Consultation; nor do they incorporate the many contributions made at the Consultation. As noted at the Consultation, the papers were prepared by the Secretariat with the primary intention of promoting discussion.

The supplement was proposed by some Members at the Consultation so that it could serve as a consolidated reference document for ongoing discussions concerning high seas fishing issues.

ABSTRACT

This document contains the eight papers prepared for the Technical Consultation on High Seas Fishing, Rome, 7-15 September 1992. They provide background information on high seas fishing issues, statistical reporting needs for high seas fisheries, the state of knowledge concerning high seas living resources and their exploitation, responsible fishing practices, new concepts and techniques for high seas fisheries management, considerations for high seas management by international fishery bodies, the participation of developing countries in high seas fishing and legal issues concerning high seas fishing*. The document also contains three annexes.

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* In this version the paper entitled legal issues concerning high seas fishing has been deleted.

BACKGROUND TO HIGH SEAS FISHING ISSUES

INTRODUCTION

1. Total annual world production from marine fisheries for direct human consumption is estimated to be 70 million tonnes and have a landed market value of US$ 70 billion.[1] However, marine fisheries production is heavily skewed in that fleets from 20 countries harvest 80 percent of the total, while 13 tropical and temperate species account for 86 percent of the total value of landings. In 1989 an estimated 7.2 million tonnes of marine production, or 8 percent of the total, were taken by all fleets operating on the high seas.[2]

2. Including inland fisheries and aquaculture, the total production of fishery products is reckoned to be 99.6 million tonnes per year. Of this amount 56 percent (56 million tonnes) is taken by developing countries and the balance (44 percent or 43.6 million tonnes) by developed countries.

3. Per capita consumption of fishery production in developing countries is significantly below the level in developed countries. In developing countries annual per capita consumption is estimated to be 9.1 kg while in developed countries the corresponding statistic is 27.1 kg.

4. The global capacity of fishing fleets has continued to grow over the past 20 years and even since the signing of the UN Convention on the Law of the Sea (UNCLOS). Over this period the relative increase in fleet size has been twice that of catches.[3]

5. It is estimated that the 1989 replacement value of the world's fishing fleet was US$ 330 billion for which revenues of US$ 70 billion are generated annually. If an economic return to capital is assumed (i.e., 10 percent), these figures imply that US$ 33 billion, or nearly 50 percent of revenue generated by the fleet, should be returned to capital invested. However, returns to labour, operating costs (fuel, maintenance and repairs), supplies, gear and insurance, are estimated to cost US$ 85 billion annually. This implies that there is an annual shortfall of US$ 48 billion (i.e., revenues of US$ 70 billion minus US$ 118 billion).

6. Under such circumstances fleets can only operate because of significant subsidies. Such payments made both for vessel construction and fleet operations disguise the real cost of fishing. This situation leads to fleet overcapitalisation and economic waste, threatening the long-term sustainability of fish resources. For example, this is most evident in the North Atlantic where catches have declined from 14.3 million tonnes in 1975 (all species taken by all fleets) to 10.1 million tonnes in 1990.

7. Fleet overcapitalisation necessitates the implementation of measures to reduce capacity if economic conditions within the industry are to be improved. Initially, the removal of subsidies should reduce capacity since vessels that cannot operate without subsidies will leave the industry. However, decommissioning programmes might also be required as a reinforcing

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[1] Statistical information contained in this paper is taken from FAO's Fisheries Department database (FISHDAB) and are for 1989. Total supply of fish (marine and mariculture production) was 86.4 million tonnes in 1989, of which 16.4 million tonnes was used for the production of fish meal, leaving a residual of 70 million tonnes for direct human consumption.

[2] Production by distant water fishing nations fleets, both under licence arrangements with coastal States and on the high seas, was approximately 9 million tonnes in 1989 or 10 percent of total production (i.e., total marine and mariculture production).

[3] Between 1980 and 1989 the Gross Register Tonnage of the world's fishing fleet increased from 19.8 million tonnes to 25.5 million tonnes.

rationalisation measure in order to achieve an optimal fleet size. Retrenchment of fleet capacity by some DWFNs has occurred. At first, by countries such as Japan and the former Federal Republic of Germany, and more recently for Eastern European countries. Future retrenchment of capacity in the former Soviet Union fleet is, at this time, speculative, although indications are that 50 percent or more of the fleet might have to be retrenched as part of the rationalisation process.

8. There is a wide and varied distribution of gear types used in world fisheries. Gear in both artisanal and industrial fisheries range from those that are generally considered to be highly selective (e.g., handlines and longlines) to those, as a result of their construction and deployment, offer limited possibilities for selectivity (e.g., some gillnets/driftnets and trawls). The need for gears to be more "environmentally friendly" is not new, having been recognised by fishermen for several decades. In certain cases the fishing industry has actively pursued gear innovation and modification in order to permit escapement for non-target species (e.g., the development of the Medina Panel for tuna purse seine nets in the United States in the 1970s to facilitate dolphin release). However, heightened environmental concerns about the impact of gears on juvenile fish and non-target species has encouraged intensified research and development in gear design and methods of deployment.

HIGH SEAS FISHING CONSIDERATIONS

9. As a consequence of (i) expanding global fleet capacity, (ii) increasing demand for food, and (iii) the need for some DWFNs to shift operations away from areas now falling under coastal State jurisdictions, high seas catches have increased, most notably in the North Pacific, South Atlantic, Indian Ocean and areas in the South Pacific.

10. Increased high seas fishing activity has impacted fisheries falling under coastal State jurisdictions, especially those fisheries involving straddling stocks, semi-pelagic resources and highly migratory species. Some of these resources are heavily fished, if not overfished, and because of a lack of a high seas management regime, their sustainability is jeopardised. Moreover, given the current and potential commercial value of many of these resources, in the absence of such a regime it can be expected that international conflicts over resource use will intensify and increase. The development of a management regime for high seas fishing should therefore facilitate sustainable exploitation and enhanced international relations.

11. Several of the world's important demersal stocks are straddling stocks, frequently occurring on continental shelves and slopes beyond EEZs. Two prime examples of such stocks are: (i) the flatfish and capelin stocks of the southeastern tip of the Grand banks of the Flemish Cap, NAFO Areas 3N and 3M in Figure 1, where stocks occur within Canada's EEZ and on the high seas, and (ii) the squid and blue whiting resources of the southwest Atlantic, including the Patagonian Shelf.[1] Stocks in this region straddle the EEZ of Argentina, the protection zone around the Falkland Islands/Malvinas and adjacent high seas.

12. Other straddling stocks can be identified. For example, most oceanic squid stocks constitute straddling stocks, as the Figure 2 shows for the international distribution of flying squids. In addition, the Alaskan pollock resource, the world's single largest stock of gadoid fish, lies within coastal State jurisdictions and high seas. In the "Donut Hole" between U.S. and Russian EEZs, annual catches by fleets from Japan, Korea, Poland, Taiwan (Province of China) and other countries may exceed 1.0 million tonnes (Figures 3a and 3b).

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[1] Figures in this paper are taken from various sources. They are intended for illustrative purposes only. FAO does not take responsibility for, or endorse, their accuracy.

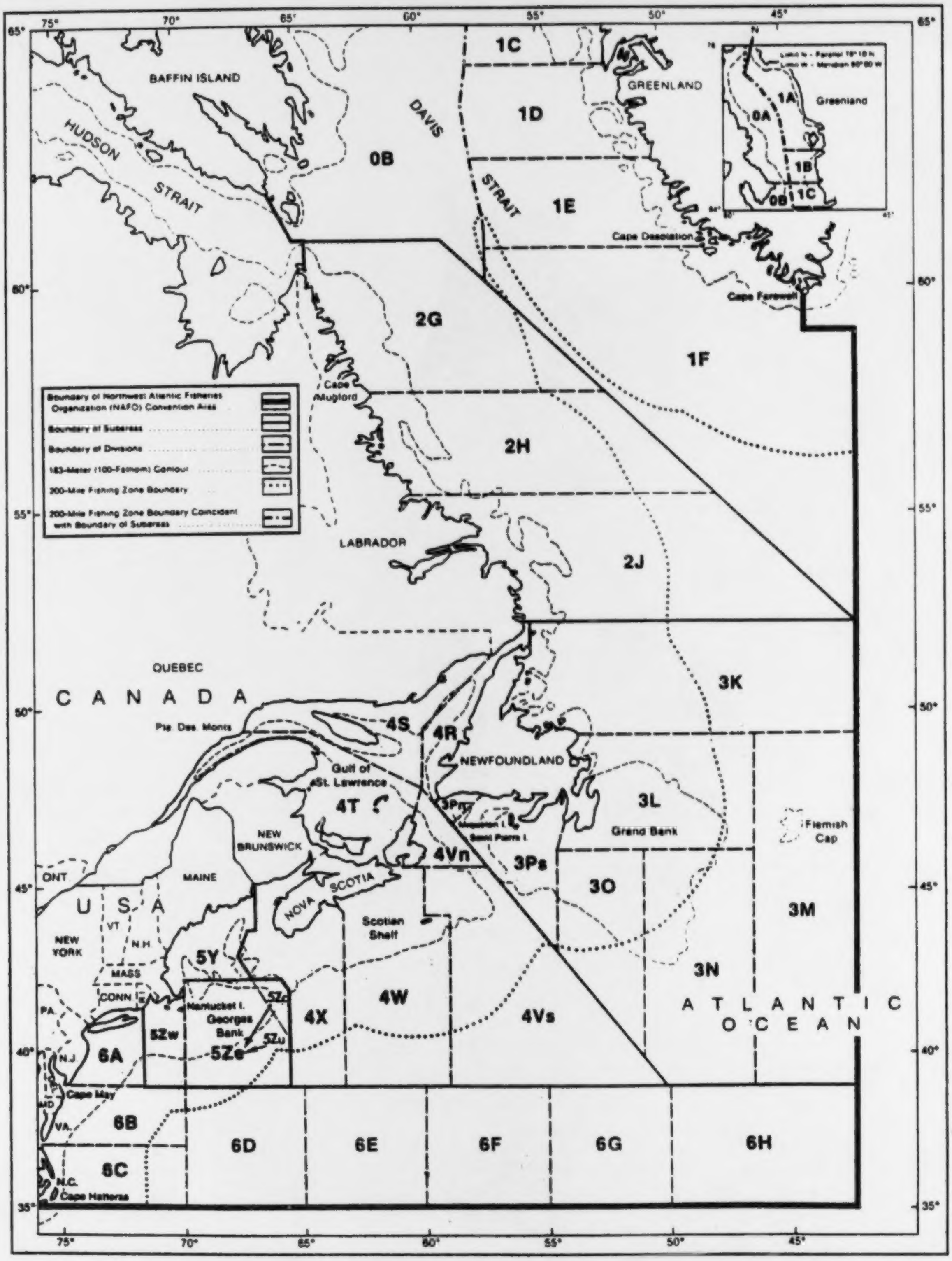

BAFFIN ISLAND
HUDSON STRAIT
DAVIS STRAIT
GREENLAND
Cape Desolation
Cape Farewell
Cape Mugford
LABRADOR
QUEBEC
CANADA
Pte. Des Monts
Gulf of St. Lawrence
NEWFOUNDLAND
Miquelon I.
Saint Pierre I.
Grand Bank
Flemish Cap
NEW BRUNSWICK
NOVA SCOTIA
Scotian Shelf
MAINE
ONT
USA
VT
N.H.
NEW YORK
MASS
CONN
PA.
N.J.
MD
VA.
N.C.
Cape May
Cape Hatteras
Nantucket I.
Georges Bank
ATLANTIC OCEAN
0A
0B
1A
1B
1C
1D
1E
1F
2G
2H
2J
3K
3L
3M
3N
3O
3Ps
3Pn
4R
4S
4T
4Vn
4Vs
4W
4X
5Y
5Zw
5Ze
5Zc
5Zu
6A
6B
6C
6D
6E
6F
6G
6H
Boundary of Northwest Atlantic Fisheries Organization (NAFO) Convention Area
Boundary of Subareas
Boundary of Divisions
183-Meter (100-Fathom) Contour
200-Mile Fishing Zone Boundary
200-Mile Fishing Zone Boundary Coincident with Boundary of Subareas
75°
70°
65°
60°
55°
50°
45°
35°
40°

Fig. 1: Map Illustrating NAFO's Convention Area and 200-Mile Fishing Zone Boundaries

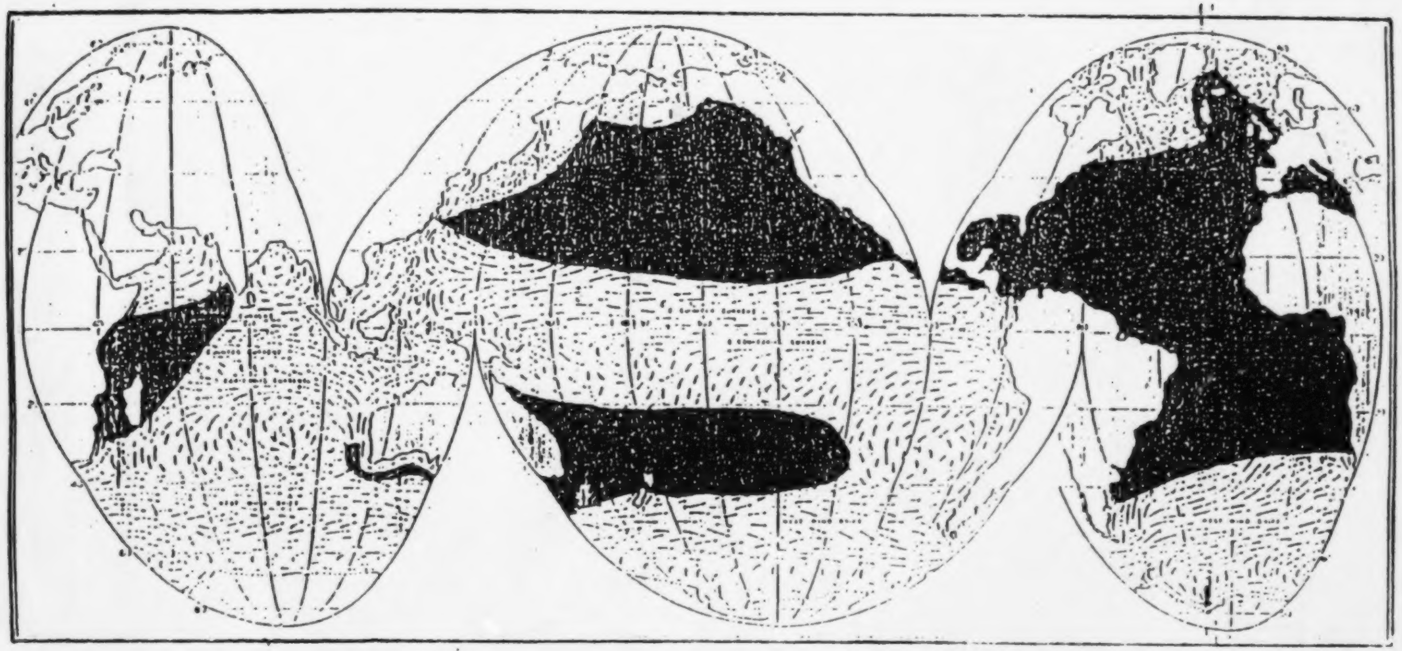
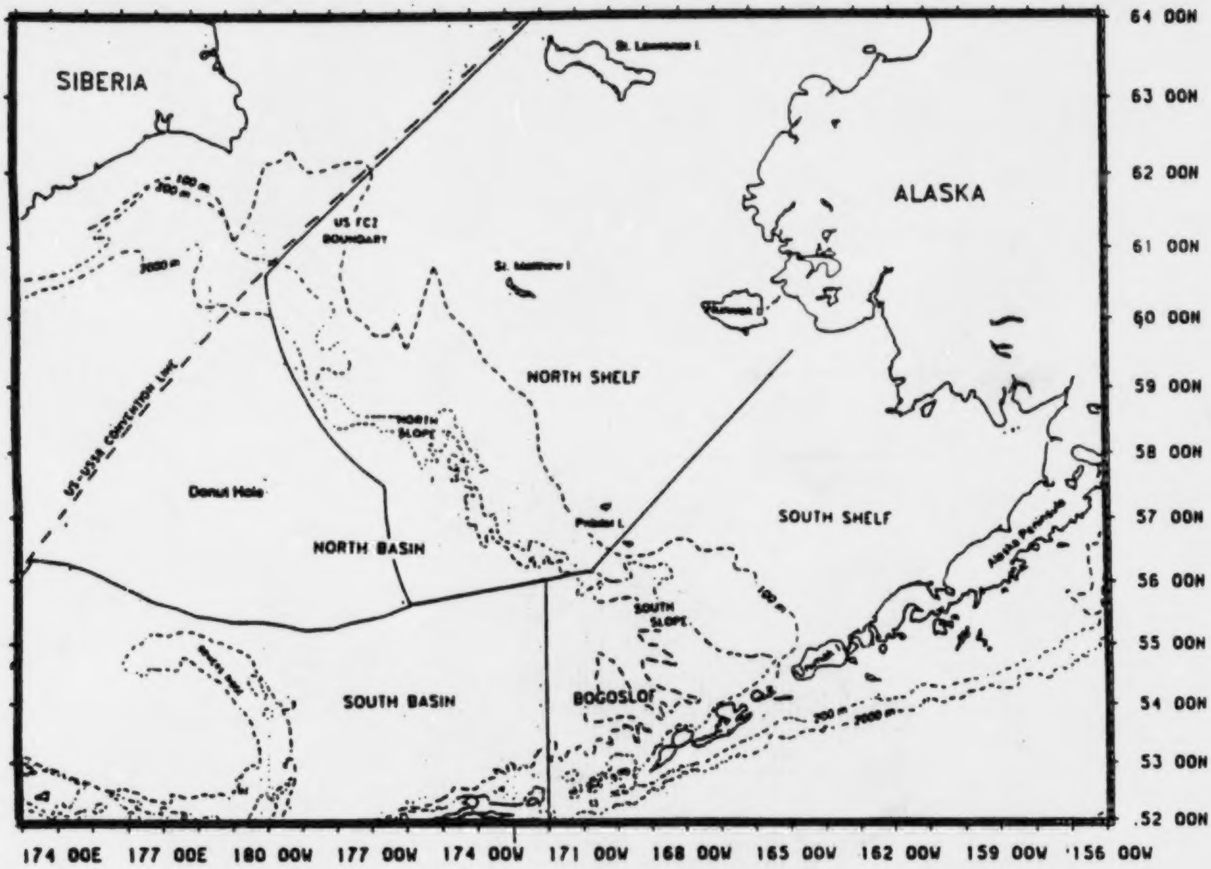


Fig. 2: Distribution Patterns of Flying Squids (Ommastrephes spp.)


SIBERIA
ALASKA
St. Lawrence I.
St. Matthew I.
Nunivak I.
Pribilof I.
US FCZ BOUNDARY
US-USSR CONVENTION LINE
100 m
200 m
2000 m
NORTH SHELF
NORTH SLOPE
Donut Hole
NORTH BASIN
SOUTH SHELF
SOUTH SLOPE
SOUTH BASIN
BOGOSLOF
Alaska Peninsula
64 00N
63 00N
62 00N
61 00N
60 00N
59 00N
58 00N
57 00N
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54 00N
53 00N
52 00N
174 00E
177 00E
180 00W
177 00W
174 00W
171 00W
168 00W
165 00W
162 00W
159 00W
156 00W

Fig.3(a): Eastern Bering Sea Shelf, Slope and Basin

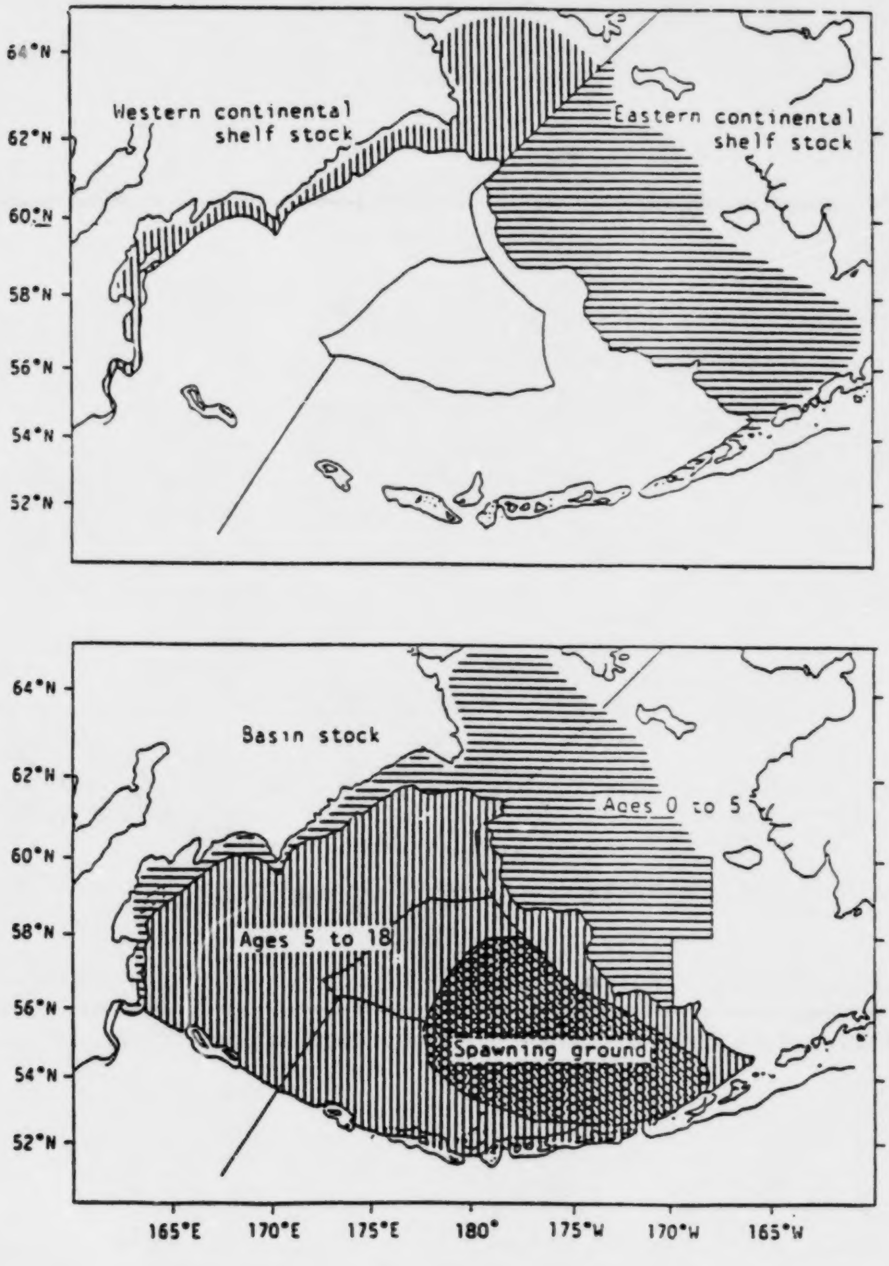
64°N
62°N
60°N
58°N
56°N
54°N
52°N
Western continental shelf stock
Eastern continental shelf stock
Basin stock
Ages 0 to 5
Ages 5 to 18
Spawning ground
165°E
170°E
175°E
180°
175°W
170°W
165°W

Fig.3(b): Schematic Distribution of the Assumed Three Stocks of Pollock in the Bering Sea

13. The extensive distribution of Peruvian horse mackerel, extending from Peru's EEZ through the South Pacific to Australia, is a straddling stock (Figure 4). Mesopelagic fish stocks of the Arabian Sea, falling partly in the EEZs of Iran, India, Oman, Pakistan and Yemen may constitute unexploited straddling stocks. It seems that there are few, if any, straddling stocks of current economic importance off the African continent. The situation with respect to straddling stocks in Southeast Asia and the South Pacific is less clear than in other parts of the world, though widely distributed tuna and tuna-like resources in these regions constitute straddling stocks, possibly together with marine mammals, particularly large whales.

14. Highly migratory species may be subject to heavy fishing when occupying restricted feeding or spawning areas, or when passing through straits, or if affected incidentally in such areas by fisheries for other species. Stocks of some tunas (e.g., southern bluefin tuna) and large whales may not recover for long periods from the levels reduced by overexploitation in the past. Tuna and tuna-like species in the Atlantic, Indian and Pacific Oceans provide prime example of resources that occur both within zones of national jurisdictions and high seas. For the South Pacific, Figure 5 shows the EEZs of countries in the region together with apparent routes of tagged skipjack tuna. Figure 5 demonstrates clearly the extent to which this resource is shared among countries in the region and between their respective EEZs and the high seas. Out of concern for management, coastal States in the South Pacific will no longer licence foreign fleets to fish for tuna in their EEZs unless they provide data on catches in adjacent high seas areas and refrain from other activities that are considered detrimental to sound management (e.g., transshipment of catches on the fishing grounds, both within EEZs and on high seas).

15. The activities of high seas fleets operating on shelf areas adjacent to coastal States' EEZ boundaries and part of the same shelf has demonstrated weaknesses in the ability of international fisheries commissions to effectively conserve and manage stocks. Attempts by coastal States to influence the exploitation of straddling stocks and highly migratory species for management purposes beyond the limits of their EEZs have led to charges by some countries of "creeping jurisdiction".

16. The weakness of fishery commissions to manage stocks is exacerbated by the fishing activities of non-contracting parties to commissions. The operation of such parties are not governed by the rules of these commissions. Moreover, when new entrants apply for membership to commissions and for a quota share, the original members do not benefit from management and conservation measures adopted in the past. In effect new members of commissions reduce the individual allocations of the former members, who might have expected larger shares as a consequence of an increased overall catch level stemming from earlier conservation measures.

17. Fisheries in high seas areas are not, under present circumstances, subject to monitoring, control and surveillance (MCS), even in cases where these areas fall within the jurisdiction of an international fishery body. Member State vessels may be nominally under the control of their national authorities, but States that are non-members of the fishery body are not governed by regulations agreed by member States. The implementation of effective MCS arrangements for high seas fisheries provides an important and major challenge.

INTERNATIONAL CONCERNS FOR HIGH SEAS MANAGEMENT

18. Concern for the sustainable use of the world's fish resources has focused attention on high seas fishing at several international fora. Whereas resources falling under coastal State jurisdictions should, by virtue of the provisions of the UN Convention on the Law of the Sea (UNCLOS), be subject to sound management practice, no comprehensive internationally agreed measures exist governing the use of high seas fish stocks. Consequently, many countries believe that a regime to regulate the exploitation of high seas resources (especially those that straddle EEZs and high seas areas and highly migratory species of fish) is necessary and should be pursued as a matter of

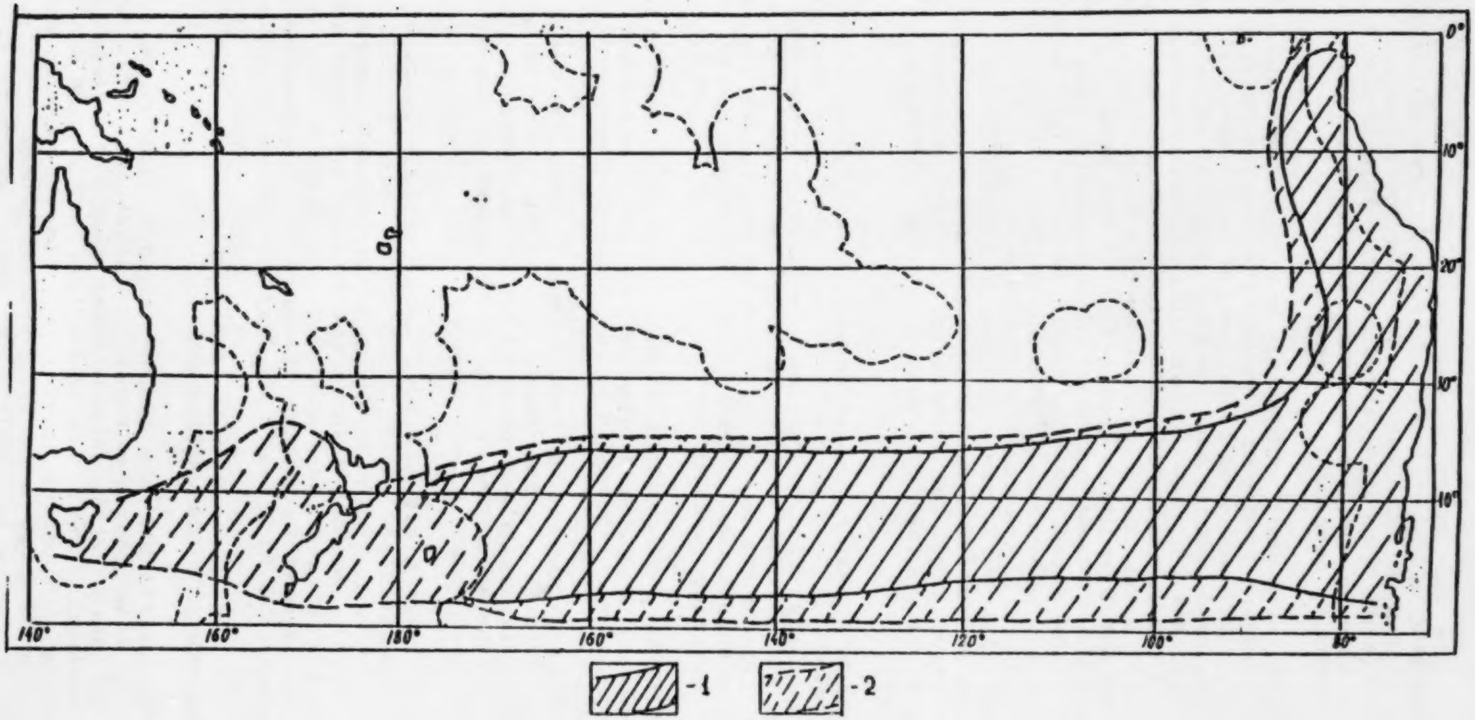
0°
10°
20°
30°
40°
140°
160°
180°
160°
140°
120°
100°
80°
-1
-2

Fig. 4: Range of Peruvian Horse Mackerel (1 - Points of Mass Occurrence; 2 - Points of Sporadic Occurrence of Concentrations)

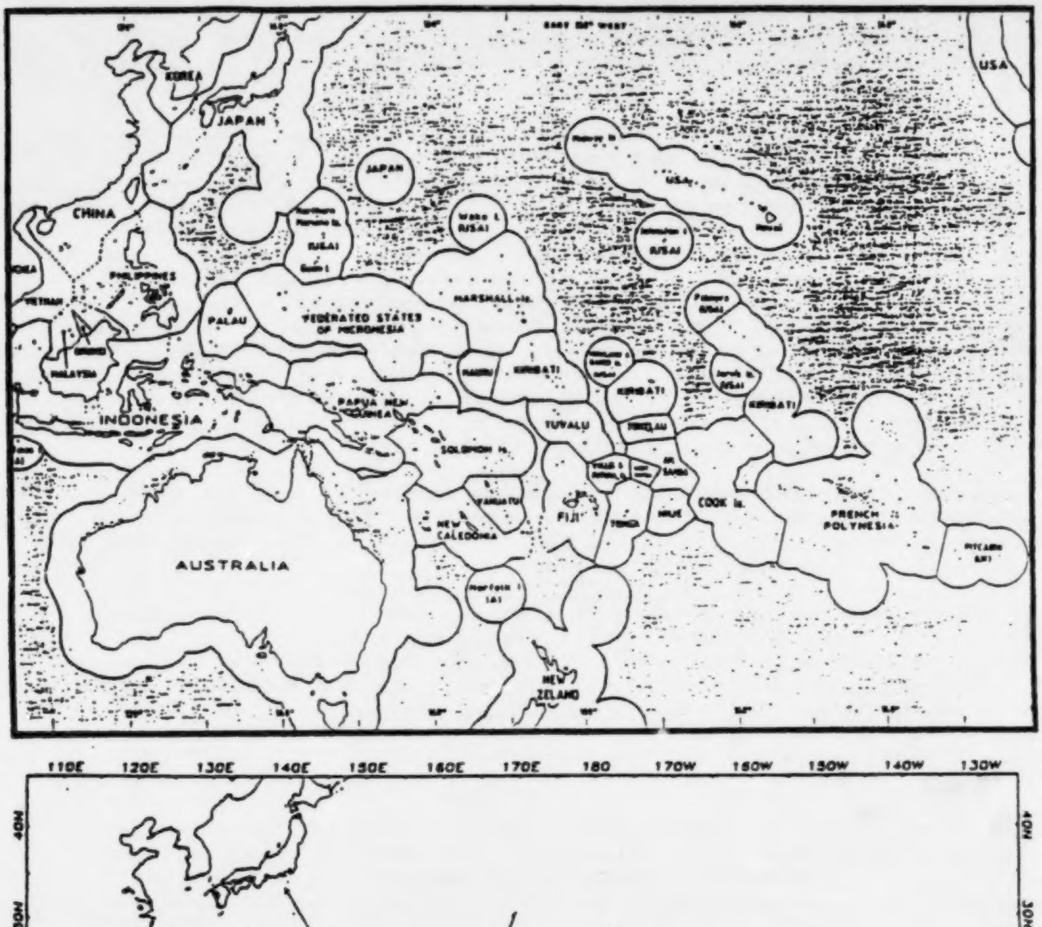
USA
KOREA
JAPAN
CHINA
PHILIPPINES
VIETNAM
MALAYSIA
INDONESIA
PALAU
FEDERATED STATES OF MICRONESIA
MARSHALL Is.
NAURU
KIRIBATI
PAPUA NEW GUINEA
SOLOMON Is.
TUVALU
TOKELAU
VANUATU
NEW CALEDONIA
FIJI
TONGA
NIUE
COOK Is.
FRENCH POLYNESIA
AUSTRALIA
NEW ZELAND
110E
120E
130E
140E
150E
160E
170E
180
170W
160W
150W
140W
130W
40N
30N
20N
10N
0
10S
20S
30S
40S

Fig. 5: Illustration of EEZs in the South Pacific and Apparent Routes of Tagged Skipjack Tunas in the South Pacific

urgency. Furthermore, there is a general recognition that high seas fishing should be preceded by prior impact assessment to ensure that unacceptable and irreversible environmental damage will not result.[1]

19. In April 1991 FAO's Committee on Fisheries (COFI) considered the high seas fishing issue and agreed that FAO and the United Nation's Division for Ocean Affairs and Law of the Sea (DOALOS, formerly known as OALOS) should cooperate in mounting an expert consultation and in turn an ad hoc intergovernmental consultation (Annex 1). It was further agreed that COFI would consider the outcomes of the consultations at it next Session. Subsequently, the Council of FAO in June 1991 agreed that FAO had an important role to play in promoting responsible conduct of fishing operations, particularly with respect to the elaboration of a code of conduct on fishing practices. The Council endorsed the need for expert and intergovernmental consultations to review the issues related to rational management of high seas resources. In November 1991 the Conference of FAO endorsed the recommendation of the Council of FAO to convene a technical consultation on high seas fishing in 1992 and an ad hoc governmental consultation.

20. This technical consultation represents FAO's initial response to the directives provided by COFI and endorsed by the Council and Conference. Matters considered at the consultation are germane to the requirements of sound high seas management practice.

21. In line with the Council position on developing guidelines for a code of fishing practice, and paralleling preparations for the Technical Consultation on High Seas Fishing, the Mexican Government in collaboration with FAO organised a Conference on Responsible Fishing in Cancun in May 1992. The Conference adopted the Declaration contained in Annex 2. In part the Declaration called upon FAO to draft, in consultation with relevant international organisations, an International Code of Conduct for Responsible Fishing.

22. With respect to high seas fishing, the Cancun Declaration (i) sought to promote within the legal framework provided by the UNCLOS, effective international cooperation towards the achievement of rational and sustainable management and conservation of the living resources of the high seas, and (ii) urged States to resolve difference concerning the proposal made at the Fourth Session of the Preparatory Committee for the United Nations Conference on Environment and Development (UNCED) to convene an intergovernmental conference on high seas fisheries.

23. FAO is responding to the request made in the Cancun Declaration to develop a code of practice for responsible fishing within EEZs and on the high seas and will present a plan to COFI on a proposed course of action for this initiative. Wide and comprehensive consultation on the issue is envisaged, including consultation with appropriate intergovernmental and non-government organisations, before a draft code is presented to COFI for approval. The process of consulting and drafting the code of practice is expected to take two years.

24. The Technical Consultation on High Seas Fishing is timely in terms of the call made in the Cancun Declaration. The Consultation will serve to promote a legal framework for management and conservation for high seas resources while concurrently enhancing understanding of the essential technical requirements for such management. It is expected to provide some of the technical and scientific information required for the United Nations sponsored intergovernmental conference on high seas fishing.

25. Consideration of high seas issues was prominent in the UNCED process. Chapter 17 of Agenda 21 dealing with the oceans, including sections on the sustainable use and conservation of marine living resources of the high seas

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[1] There is, however, a current lack of guidance on how to define acceptable impacts and a lack of technical capacity to assess fishing impacts before fishing commences.

(Annex 3). National and international management and conservation of straddling stocks and highly migratory species were highlighted by many countries as being particularly important issues requiring attention because of the need for coordinated management both within EEZs and on the high seas. It was agreed that a United Nations sponsored intergovernmental conference focusing on the implementation of the UNCLOS provisions relating to straddling stocks and highly migratory species should be convened, drawing on, inter alia, scientific and technical input from FAO. As a consequence of the agreement for an intergovernmental conference, a number of the specific provisions of the draft Agenda 21 concerning high seas fishing were deleted from the final text in recognition of their complexity and the need for them to be scrutinised in greater technical detail at the conference.

26. A timeframe for the United Nations sponsored intergovernmental conference has yet to be established but considering the necessary participatory process it is unlikely that it will be held before the end of 1993. However, it is envisaged that the Technical Consultation will identify, inter alia, and assess problems associated with straddling fish stocks and highly migratory species of fish and focus on possible solutions to these problems, providing essential inputs to the conference. These outcomes should facilitate the work of the United Nations sponsored intergovernmental conference and assist in the development of its recommendations.

THE WAY AHEAD

27. The UNCED call for an intergovernmental conference on high seas fishing to be sponsored by the United Nations reinforces the conclusions of the FAO governing body on this matter and stresses the need for FAO and the United Nations to cooperate closely in this undertaking. In any event, FAO will continue to cooperate with DOALOS on technical and scientific matters pertaining to high seas fishing and will actively contribute to the United Nations intergovernmental conference. Such an approach will ensure that ongoing parallel activities within the two organisations are coordinated for the ultimate goal of achieving sustainable and rational use of the world's high seas fisheries resources.

28. The Declaration of Cancun calls on the United Nations to declare the next 10 years the Decade of Responsible Fishing. Within this period concerted efforts could be made to ensure that all the world's fish stocks are exploited in a sustainable manner, that overcapacity in the world's fishing fleets is reduced and a code of practice for responsible fishing is agreed and implemented.

HIGH SEAS FISHERIES: STATISTICAL REPORTING

BACKGROUND

1. FAO has been collecting fishery statistical information since 1948. The present system, however, has been in place since the mid-1960s to record, primarily, catches by species, by countries and by areas. It is a system that was adopted in recognition that the data provided by Member Nations should be a standardized summary of national data, in order to keep the burden on national statistical agencies to a minimum. Through a cooperative agreement established in the late 1950s (the Coordinating Working Party on Atlantic Fishery Statistics), the standardization and harmonization of data collection in the Atlantic area has been coordinated between regional fishery commissions and FAO.

2. At the end of the 1970s, as the majority of coastal States extended their fisheries jurisdictions to 200 nautical miles, there was an increasing awareness that perhaps the existing statistical areas might need amendment to record catches within the new areas of jurisdiction. With the adoption of the UN Convention on the Law of the Sea (UNCLOS), however, it became apparent that any such amendment would be premature due to the numerous bilateral negotiations that would have to be undertaken in order to delimit the maritime boundaries associated with the extensions in jurisdiction.

3. By the end of the 1980s many maritime boundaries had been negotiated. At the same time, fisheries were increasingly developing on the high seas and it became evident that the existing FAO statistical system was unable to report these developments in sufficient detail. This was demonstrated during the development of the drift-net fishery in the North Pacific and later in the South Pacific, culminating in the UN General Assembly Resolution 44/225 of 30 July 1990, whereby the Resolution:

> *"calls upon all those involved in large-scale pelagic drift-net fishing to cooperate fully with the international community, and especially with coastal States and the relevant international and regional organizations, in the enhanced collection and sharing of statistically sound scientific data in order to assess the impact of such fishing methods and to secure conservation of the world's living marine resources."*

THE FAO FISHERY STATISTICAL SYSTEM

4. FAO's fishery statistical system presently collects data on 995 species from 227 countries and political entities. National reporting offices submit catch data in terms of quantities and species by FAO Major Fishing Areas for Statistical Purposes (inland and marine). These areas are specifically large. The Indian Ocean is divided into two areas. The Atlantic Ocean is divided into areas that match the areas under jurisdiction of international fisheries commissions, e.g., the North Atlantic is divided into areas coinciding with the Northwest Atlantic Fisheries Organization (NAFO) and the International Council for the Exploration of the Sea (ICES). The Central Atlantic areas coincide with the FAO regional fishery bodies, the Committee for the Eastern Central Atlantic Fisheries (CECAF) and the Western Central Atlantic Fishery Commission (WECAFC), the Mediterranean with that of the General Fisheries Council for the Mediterranean (GFCM).

5. The two South Atlantic areas were consistent with the former International Commission for the Southeast Atlantic Fisheries (ICSEAF) and the Comisión Asesora Regional de Pesca para el Atlántico Sudoccidental/Regional Fisheries Advisory Commission for the Southwest Atlantic (CARPAS).

6. For the Pacific, the areas are not coincidental with the International North Pacific Commission (INPFC) or the South Pacific Commission (SPC). Regional fisheries commissions do not exist for the FAO statistical areas covering the southwest, western central and eastern central Pacific. Attempts by FAO to change existing statistical areas to match regional responsibilities in the Pacific have been accepted for the South China Sea (Area 71), the South

Pacific Commission (Area 74) and for the Southeast Pacific (Area 87). For the latter, the Comisión Permanente del Pacífico Sur (CPPS), the boundaries established in 1989 coincide with those of Area 87 and this Area is divided

into sub-areas for catches inside and outside the 200-mile fisheries jurisdiction.

7. From the existing statistical system, FAO is able to report catches by Member Nations' fishing vessels operating in any statistical area. In 1989 the catch by vessels operating outside of the area adjacent to their coasts was approximately 9 million t. This catch represents 11% of the total marine catch in 1989 and is 1.5 million t more than 1979. Principal species caught in 1990, including major areas of catch, were as follows:

SPECIES	tons	Area
Tunas	1 633 823	all areas
Chilean Jack Mackerel	1 165 300	87
European Pilchard	792 217	34
Various Gadoids	628 309	
Squids *(Loliginidae)*	620 419	
Various Jacks, Mullets, etc.	532 931	
Krill, Antarctic	381 214	48
Alaska Pollock	358 455	61, 67
Round Sardinella	266 222	34
European Anchovy	254 342	34, 37
Chub Mackerel	212 689	
Cape Horse Mackerel	205 337	47
Cape Hakes	202 004	47
Other Redfishes, Breams, Groupers	134 647	
Redfishes	105 617	
Squids, other	100 000	
Total	7 593 526	

8. From the above table, tunas represent 20% of the total catch by non-coastal States and are also the most valuable species taken. Chilean Jack Mackerel, at just over 1 million t, is similar to the other pelagics listed and of relatively lower value. The total catch of these pelagic species is about 2 million t.

9. A total of 32 coastal States reported catches by their vessels in areas outside their own immediate fishing area in 1990, an increase of six more countries compared to 1979. Six coastal States caught 7.2 million t out of a total of 8.2 million t, the remaining 26 States sharing 1.0 million t.

10. Whereas the FAO system reports catches by large statistical areas, it cannot report on catches by non-coastal vessels inside a coastal State's jurisdiction as a result of access agreements. With the exception of Area 87, it also cannot report on catches by coastal States within the adjacent statistical area but outside of national jurisdiction; in effect the high seas area adjacent to the coastal State's jurisdiction. Although the United States of America reports landings of fish taken between 0 and 3 miles from shore, from 3 to 200 miles and as well as catches by US vessels operating in international waters and in other coastal States' jurisdictions, preliminary inquiries show that most national statistical agencies would not be able to provide this detail.

REGIONAL FISHERY COMMISSIONS

11. Where regional fishery commissions are established, such as NAFO, ICES, INPFC, the task of reporting catches by countries on the high seas part of the area under their jurisdiction is not straightforward for a number of reasons; one is the problem of fishing in the area by non-contracting parties who have no statutory obligation to report any catches. In contrast, the representatives of the Scientific Council of NAFO have recently been requested to advise national statistical offices of their respective States to report catches from inside and outside the 200-mile boundary.

12. For tuna, the reporting of statistical data is different. The International Commission for the Conservation of Atlantic Tunas (ICCAT) collects and reports fishery statistics on all tuna catches anywhere in the Atlantic Ocean, including the Mediterranean Sea, by 1° latitude and longitude squares. Estimates of tuna catches in the high seas areas of the Atlantic are considered to be in the range of less than 10% of total recorded catches.

13. The Inter-American Tropical Tuna Commission (I-ATTC) collects tuna data for areas in the Eastern Pacific (see map). Catches are reported by the Commission for skipjack, yellowfin, bigeye, bluefin, bonito and albacore species by 5° squares.

14. For the Pacific, tuna catches are reported directly to FAO by countries fishing within the relevant statistical areas. The South Pacific Commission receives more detailed information on catches from the log-books provided by non-coastal fishing vessels operating under access agreements. Such information includes species, gear, catch per unit of effort, and area.

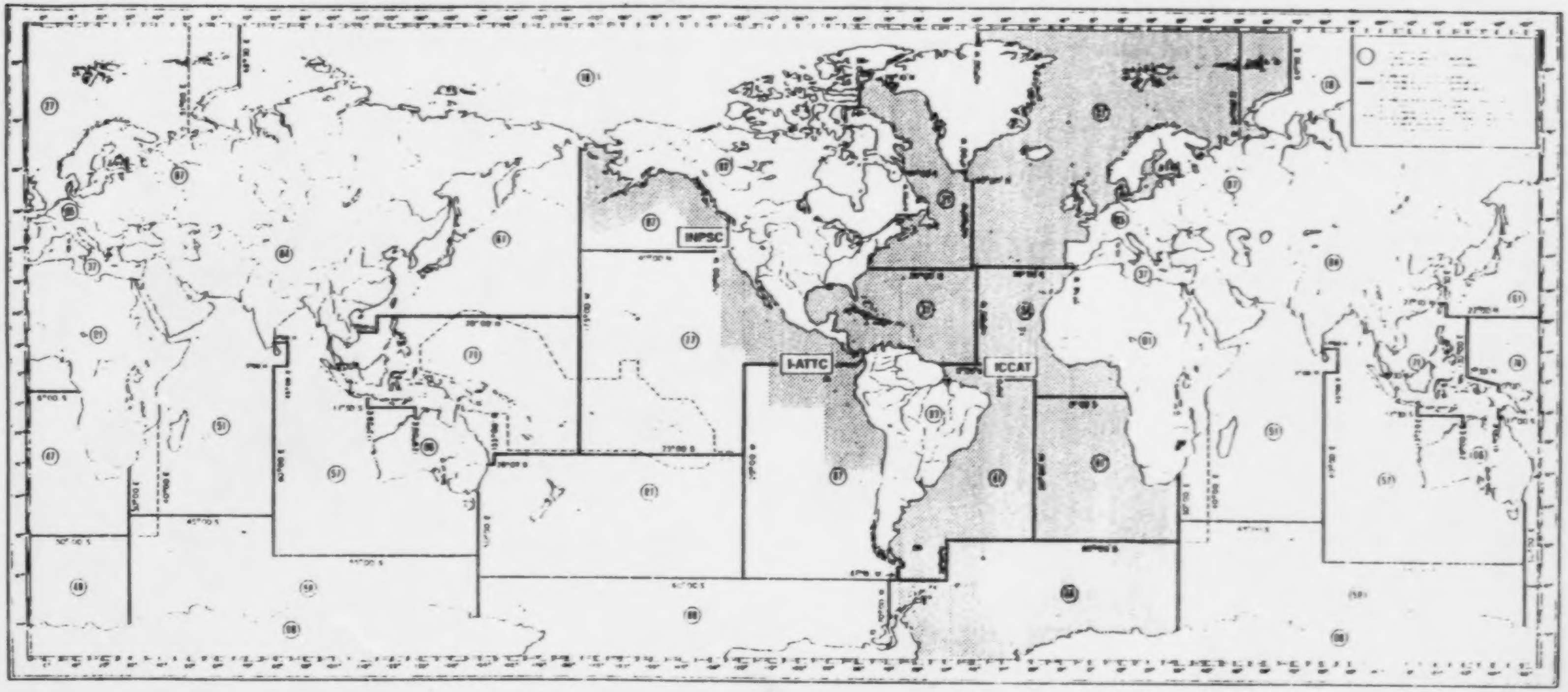
15. Fishing vessels of States not party to the above tuna bodies and fishing on the high seas are therefore only responsible to their flag States, many of which do not have legislation requiring their vessels to report catches taken beyond national jurisdiction, and not party to bilateral access agreements.

16. In its Article No.119, "Conservation of the living resources of the high seas", UNCLOS states:

> *"2. Available scientific information, catch and fishing effort statistics, and other data relevant to the conservation of fish stocks shall be contributed and exchanged on a regular basis through competent international organizations, whether subregional, regional or global, where appropriate and with participation by all States concerned."*

17. From the attached maps, the FAO statistical areas not covered by international regional fishery commissions can be identified. After implementation of the proposed statistical area boundary changes for Areas 71 and 74, areas that are not covered by regional fishery commissions, are: the South Atlantic - Areas 41 and 47, the North Pacific - Areas 61 and 67, the Eastern Central Pacific - Area 77 and the Southwest Pacific - Area 81. In general, the Pacific remains the oceanic area with the least coverage by regional fishery commissions.

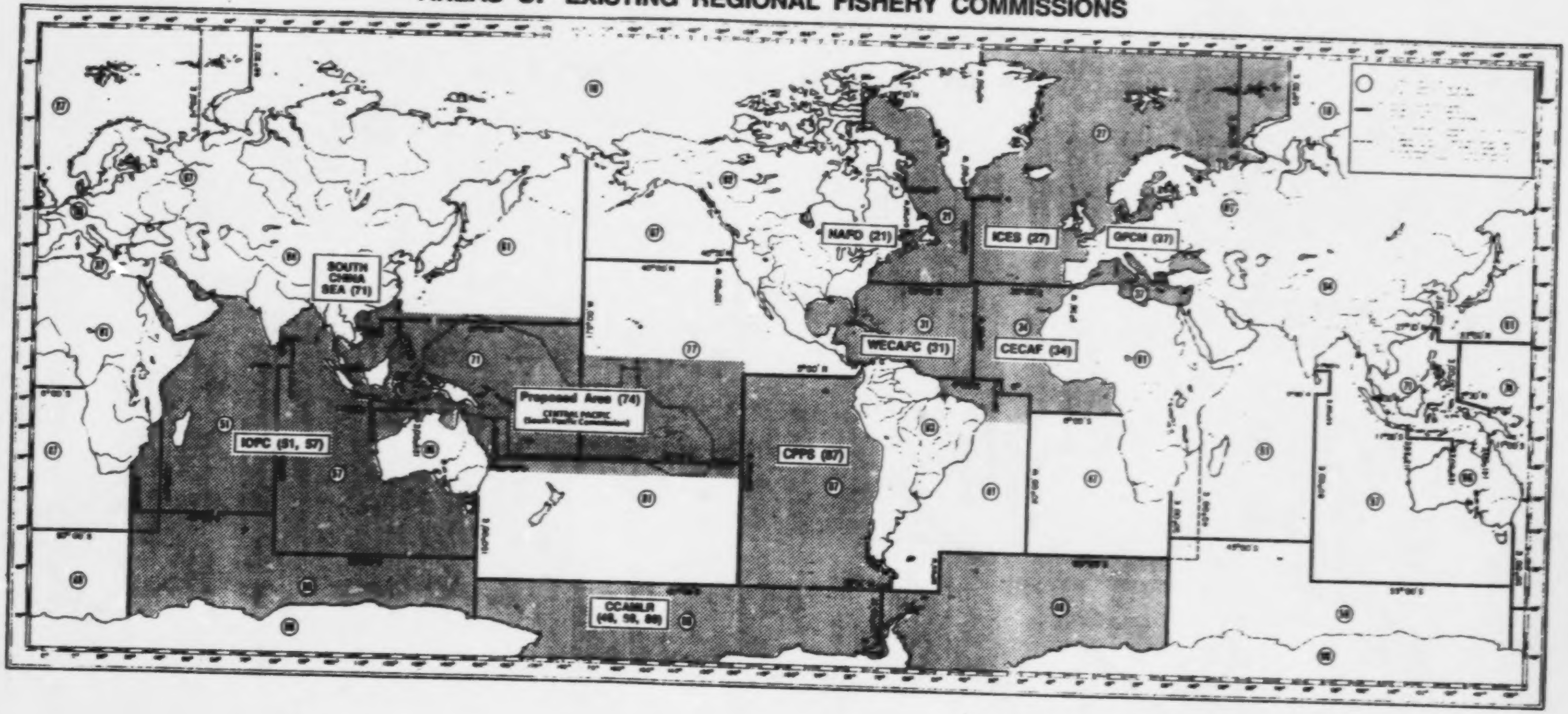
AREAS OF COMMISSIONS CONCERNED WITH SPECIFIC SPECIES



World Map of FAO Major Fishing Areas for Statistical Purposes

Please note FAO proposed change to establish Major Area 74. The proposed boundary between areas 61, 71 and 74 is indicated on the right side of the map.

AREAS OF EXISTING REGIONAL FISHERY COMMISSIONS


SOUTH CHINA SEA (71)
NAFO (21)
ICES (27)
GFCM (37)
WECAFC (31)
CECAF (34)
Proposed Area (74)
CENTRAL PACIFIC
(South Pacific Commission)
IOPC (51, 57)
CPPS (87)
CCAMLR
(48, 58, 88)

Please note FAO proposed change to establish Major Fishing Area 74, to coincide with the area of South Pacific Commission. The proposed boundary between areas 61, 71 and 74 is indicated on the right side of the map.

For more detailed information on international fishery commissions and their corresponding areas of jurisdiction, please refer to document FIP/C835(Rev.1).

18. However, the establishment of regional fishery commissions for areas not presently covered, may not necessarily result in improved statistical reporting. This is the result of long-standing practice, whereby the reporting of catches by fishing vessels has been used for management purposes, in particular determining catch quotas, which provides incentive for vessels to under-report their catches.

19. In recognition of the incentive provided for under-reporting catches consideration may wish to be given to two alternative approaches:

> (i) following the ICES practice, whereby two sets of data are maintained. This could result in FAO having different data than those provided to regional fishery commissions and make the statistical coordinating role of FAO difficult;
>
> (ii) change the practice of using catch data for the calculation of management measures so that the provision of such data can reward fishermen. Where historic rights are used to determine access to a fishery by fishermen, the catch is rarely under-reported.

DATA REQUIREMENTS FOR HIGH SEAS

20. The present reporting system, while considered adequate for recording catches by species and by flag States, does not cover bycatch/discards, fishing gear used and fishing effort.

21. The present issues concerning high seas fisheries are directed at the bycatch of marine mammals, turtles and seabirds and other species. Few coastal States today maintain statistics on bycatches, including the species mentioned above. In the same way, discards of unwanted fish species are not recorded except for those countries using onboard observer programmes on their fishing vessels. It should be noted, however, that I-ATTC requests data on sharks caught in tuna fishing operations, and ICCAT, concerned that the catch of pelagic sharks is reaching considerable proportions, is making estimates of the shark bycatch. There is presently no identifiable solution to the recording of bycatch/discard information, since cross-checking of such data would not be possible with no commercial trade involvement. The Consultation may therefore, wish to consider the issue of the bycatch of mammals, turtles, seabirds and other species under the agenda items covering research and management.

22. The recent international concern with large pelagic drift-nets and the consequence of banning such gear, revealed inadequacies in reporting catches by gear type. For the FAO statistical system, Member Nations report on their fishing fleets by registered tonnage/length overall, and by gear type. The number of purse-seines or trawlers is therefore provided, but catch by these gear types is not identifiable. It is suggested that with environmental concerns associated with some of these gear types, the international community may wish to be able to evaluate the impact of specific fishing gears in terms of numbers of vessels, as well as the catches by gear.

23. Fishing effort statistics, although deemed necessary in the assessment of stocks, have not proven to be satisfactory. Recently the ICES Statistics Committee Liaison Working Group has recommended the elimination of the STATLANT 27B Form, the questionnaire for recording fishing effort data in Area 27.

RE-DEFINEMENT OF STATISTICAL AREAS TO COVER HIGH SEAS

24. Catches taken on the high seas are not distributed all over the oceanic areas. In most of the open ocean areas the density of most stocks is low. To harvest these stocks it is necessary to filter greater quantities of water with the use of exceptionally large drift-nets, longlines or pelagic trawls. For tuna species it is possible to use natural or artificial aggregating devices to increase the density of shoals. Fisheries of this kind are

relatively clearly defined in terms of general area and occur in all three oceans.

25. In the same way squid fisheries occur in specific areas and where the density of the stocks is high, jigs are used for catching. Where the density is not high, such as in the North Pacific, the areas where large pelagic drift-nets were allowed to be used was defined by latitudinal and longitudinal references as a box. The adoption of this approach for most open ocean fisheries would appear to be preferable to an approach of establishing large statistical areas covering only high seas areas. In particular, the box approach allows for directed management regimes to be applied, whereby the box can be opened and closed to fishing depending on the abundance of stocks, migratory seasons for mammals, etc., and the amount of effort. The Consultation may wish to consider the application of the "box" principle under other agenda items, but its relevance to statistics should be noted.

26. Whereas the "box" principle has direct application to open ocean fisheries for species other than tunas, the practice for tuna species has also been to record catches by boxes defined either in 1° latitudinal and longitudinal areas (ICCAT) or 5° areas (I-ATTC). The difference therefore occurs between using 1° or 5° squares for large areas under the geographical coverage of the tuna commissions or uniquely defined boxes in large oceanic areas such as that for the INPFC.

27. High seas fisheries also occur in areas where continental shelves and slopes extend beyond 200 miles from shore; notably the Grand Banks in the Northwest Atlantic off Canada; the "doughnut hole" in the Bering Sea between Russia and the USA; the Patagonian shelf off Argentina and the Campbell Plateau off New Zealand.

28. For the information of the Consultation there are three other areas where high seas conditions occur. These are the Mediterranean Sea, where jurisdictions have not been extended, the South China Sea where disputes over ownership of islands in the middle of the sea have not been resolved, and in the Antarctic where narrow limits established by the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) do not effectively cover fishing areas in the Southern Oceans.

SUGGESTED ACTION BY THE TECHNICAL CONSULTATION

29. The Consultation is invited to consider the possibility of establishing a system to report catches in the high-seas through on the one hand, a direct approach from FAO to major high-seas fishing nations, using a modified STATLANT questionnaire, and on the other hand an intensified cooperation with the regional fishery bodies for selected species.

30. The Consultation is invited to consider the needs for recording catch by gear which would require establishing a register for fishing vessels authorized to operate on the high seas. In this connection the problems associated with recording bycatches and discards should be noted.

31. It may be wished to give consideration to the means by which open ocean areas can be appropriately identified for statistical purposes and the particular problem regarding extended continental shelf areas.

THE STATE OF OUR KNOWLEDGE ON HIGH SEAS LIVING RESOURCES AND THEIR CONTROLLED EXPLOITATION

INTRODUCTION

1. The provisions of UN Convention on the Law of the Sea (UNCLOS) place emphasis on the requirement for research of high seas resources by participating fishing States. This is most explicitly stated in Articles 65 and 120 (Marine mammals) which refers to the need for their conservation, management and study. A similar obligation can also be deduced for other resources, given the extensive information needs for conservation and management laid down in Article 119.

2. Several specific research issues follow directly from Article 119, paragraphs 1a and 1b. These include the need to develop techniques of assessment of maximum sustainable yields (MSY) of harvested species and to better understand relevant economic and environmental factors. There is a requirement for data on patterns of fishing and on interdependence of those stocks for which the MSY benchmark applies and a need to assess the population levels of non-target species at which their reproduction is not seriously affected by fishing.

RESEARCH ORGANIZATION

3. In Article 87, UNCLOS provides for the freedom of scientific research on the high seas, and paragraph 2 of Article 119 requires States to contribute and exchange available scientific information of relevance to the conservation of fish stocks. A significant expenditure on research has to be underwritten by individual fishing States, given that no other specific provision for covering research costs is made in the UNCLOS treaty from international sources of funding. Those States engaged in high seas fisheries have a particular obligation to cooperate in the conservation and management of the stocks and, by inference, this can be extended to a duty to undertake and cooperate in research. Such cooperation could take place bilaterally or within a fishery organization set up for the purpose. Implicitly, participating States are assumed to cover the costs of such research.

HIGH SEAS ENVIRONMENT, AND FACTORS AFFECTING ITS PRODUCTIVITY FOR FISHERIES

4. Although there are areas of high local production beyond Exclusive Economic Zones (EEZs), the high seas, especially beyond the limits of continental shelves and slopes, may be regarded as relatively unproductive from the perspective of fisheries. Rarely is it possible to consider these resources totally independently from events occurring within adjacent EEZs, and a large proportion of high seas catches come from straddling and highly migratory resources. In consequence, in most cases it is impossible to assess their status without knowing the catches from both inside and outside EEZs.[1] Unfortunately, due to reporting uncertainties, information concerning the proportion of high seas catches from most straddling stocks, as opposed to those taken within national EEZs, is poor. As a result, the total figure for global production beyond EEZs can only be roughly estimated.

5. Reported catches from high seas areas are around 9 million t. This leads to rough estimates of no less than 12 million t as an order of magnitude for high seas catches, taking into account likely under-reporting. This estimate assumes roughly 4 million t each for Alaska pollock, grenadiers plus blue whiting, and another 4 million t for squid plus tuna.[2] Note that since these landings come from an area of roughly 183 million km^2 (36% of the

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[1] The area of oceans is 71% of the global surface, equivalent to 361 million km^2. Of this amount, 35% of the surface falls within EEZs. Therefore the remainder, 36% or 183 million km^2 lies outside EEZs.

surface of the globe), the conclusion must be that the fishery productivity of offshore areas on average is very low, of the order of 0.05 t/km^2.[1]

6. Do these low offshore production figures correspond to levels of full exploitation? The answer appears to be that for tuna, some key squid species, and Alaska pollock, exploitation rates under current harvesting regimes are not far from MSY levels. For mesopelagic fish, krill, many squid species of oceanic areas, and invertebrate and fish resources of the continental slopes beyond 200 miles, the rates of exploitation are still generally low. In other cases, the picture is not so optimistic: some tunas and sharks are under excessive fishing pressure; stocks of many large whale species have been decimated in the past and are slow to recover, marine turtles are under threat of decline due to incidental catches almost everywhere and environmental degradation, and the status of certain specific small cetaceans is causing concern.

7. The low fishery productivity of high seas areas mentioned above has led to the description of offshore oceanic areas as 'watery deserts' but this has not impeded economically-viable exploitation. Such low average productivities, together with the high fuel costs and extended sea time involved, would impose severe limitations on the economic feasibility of high seas fishing operations if the resource were spread evenly throughout all offshore areas.

8. The above description is partly misleading however, for two reasons because it (i) does not sufficiently take into account the distinction between biological productivity and fish production, and (ii) treats as homogeneous, areas that differ widely in their biological importance to oceanic fish populations and to fishermen.

9. Recent studies have increased our estimation of the biological production or 'turnover' of living materials in the oceans, but the problem is that much of this occurs at the microscopic level, and inevitable losses of the order of 90% or so of the production occur at each step upwards in the food chain. As a result, despite the very significant biological production supported by some offshore oceanic areas, in rare cases is this available to human harvest, which, for technological and economic reasons, is concentrated largely on the top predators in the oceanic food chain. By the time organisms reach harvestable sizes, fish such as tunas would be too rare to justify the expense of distant-water harvesting if they were spread out evenly throughout the surface waters of the oceans. Fortunately, they are schooling species, otherwise the large-scale harvest of tunas would not be economically feasible on an industrial scale.

10. The migratory strategy of large pelagics, such as tunas and cetaceans, appears then to be largely dictated by the need to search for local concentrations of food separated by large areas where their nutritional requirements cannot be satisfied. In this sense, their problem is not radically different from distant-water fishermen, who use the presence of dolphins, seabirds, colour changes in the water, and floating debris as clues to the possible presence of fish. Tuna schools can be regarded as 'system integrators' which make a widely dispersed, diffuse productivity at least partly available for economically-viable harvesting by man.

11. Much of the harvestable production of the oceans then, is concentrated into relatively small areas with particular hydrographic characteristics, which are nowadays progressively easy to locate with modern technology such as satellite imagery, supplemented by high-precision position-finding devices. Several such areas can be distinguished:

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[1] For comparison, note that annual production of commercially valuable species on shelf areas, varies from some 0.5 t/km^2 in relatively unproductive areas, to estimates as high as 8 t/km^2 in some productive inshore environments. For another standard of comparison, note that free range livestock operations on land produce in the order of 1 t/km^2.

(i) the offshore fringes or plumes of upwelling areas, as in Peru, off West Africa, in the northern Arabian Sea, etc.

(ii) discontinuities or boundaries between adjacent water masses, such as thermoclines, frontal zones, tropical divergences, etc. (Figure 1).

(iii) areas of convergence or downwelling where food organisms and floating debris accumulates (Figure 2).

(iv) around seamounts and small offshore islands.

12. Two main points can be made as a result of this situation, namely, that despite the great extent of oceanic surface, harvestable concentrations of living marine resources are concentrated in time and space into relatively well defined areas for feeding and reproduction. These areas are largely known to fishermen, and are hence very vulnerable to intensive fishing.

13. In the case of marine mammals, sea birds and turtles, and to a lesser extent, fish species which concentrate in them, areas of convergence have also been subject in recent years to high surface concentrations of entangling or accidentally ingested plastic and other materials which are now being reported with increasing frequency, even in offshore areas.

HIGH SEAS RESOURCES

14. Over the last decade, high seas fisheries have developed in response to heavy exploitation of fish stocks on continental shelves, and to the restricted possibilities within former distant-water fishing grounds, now lying within EEZs. Some examples of such offshore resources and fishing areas are Alaska pollock in the central Bering Sea, squid and southern blue whiting on the Patagonian Shelf. Other potential or rapidly developing bottom fisheries exist in a number of other areas, such as for deep-water demersals like orange roughy in the Southern Hemisphere; rat tails and grenadiers in the Atlantic. Another incentive for development of these fisheries has been the perception that offshore resources may be less affected than inshore fish by the accumulation of pesticides or contaminants due to man's activities on land.

15. The point could be made that nearly all resources taken on the high seas occur within EEZs at some stage of their life history (for example, juveniles of some tropical tuna species have been found in abundance around coral reefs). Even at commercially exploitable sizes, these high seas resources are for the most part straddling or highly migratory stocks that fall at least partially outside EEZs, either on the edge of wide continental shelves (e.g., the Flemish Cap in the northwest Atlantic, and the edge of the Patagonian Shelf in the southwest Atlantic), or along continental slopes which offer attractive alternatives to large specialized fishing vessels. Here, the need for agreements with coastal States sharing the same stocks as those fished on adjacent high seas areas, is not defined clearly in UNCLOS provisions.

16. It appears that most deep-water stocks of demersal fish and invertebrates of continental slope areas have relatively low densities and growth and reproduction rates, so that a sustainable yield will only be possible with relatively low rates of harvesting and a limited number of specialized fishing vessels. There are also relatively small fishery resources on sea mounts and offshore banks beyond national jurisdiction, notably populations of deep-water precious corals. Other small but important categories are resources of isolated small islands or atolls, and the fish populations of limited ice-free shelfs in Antarctic areas. These latter have been subject to relatively uncontrolled exploitation over the last three decades, and the above comments for slope populations apply here also.

17. A further category of almost entirely unexploited resources are mesopelagic fish and certain oceanic squid populations that occupy narrow but

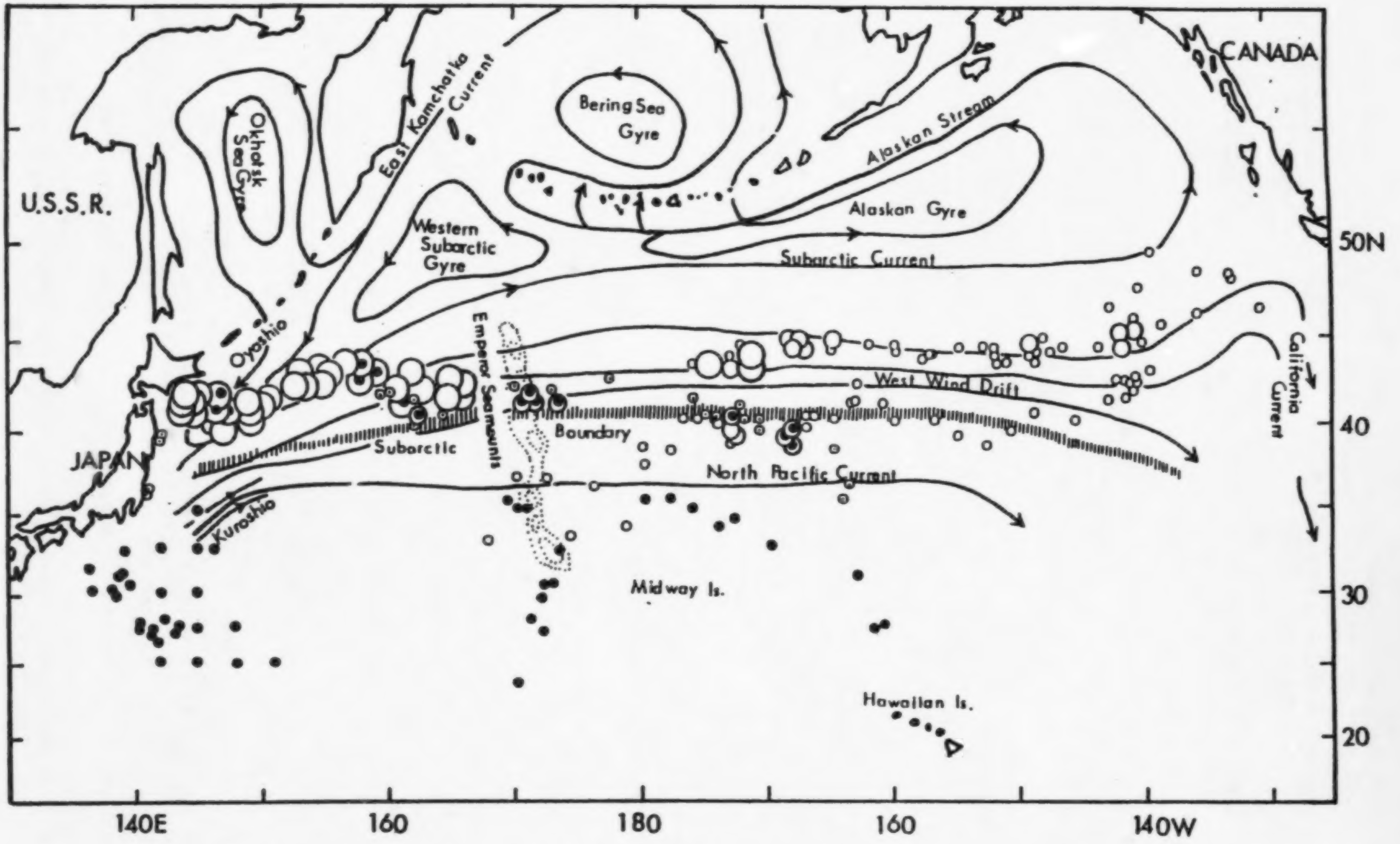
U.S.S.R.
Okhotsk Sea Gyre
East Kamchatka Current
Bering Sea Gyre
Alaskan Stream
Alaskan Gyre
CANADA
Western Subarctic Gyre
Subarctic Current
Oyashio
JAPAN
Emperor Seamounts
West Wind Drift
California Current
Subarctic
Boundary
North Pacific Current
Kuroshio
Midway Is.
Hawaiian Is.
140E
160
180
160
140W
50N
40
30
20

Fig. 1 Distribution of Ommastrephes bartrami in the north Pacific during the year from June 1978 to February 1980

Migration: ○ Northward migration (June-Sept.)
⊙ Southward migration (Oct.-Dec.)
• Spawning migration (Jan.-May)

Catch per jigging through one night:
o below 1 t ○ 1-2.9 t ◯ over 3 t

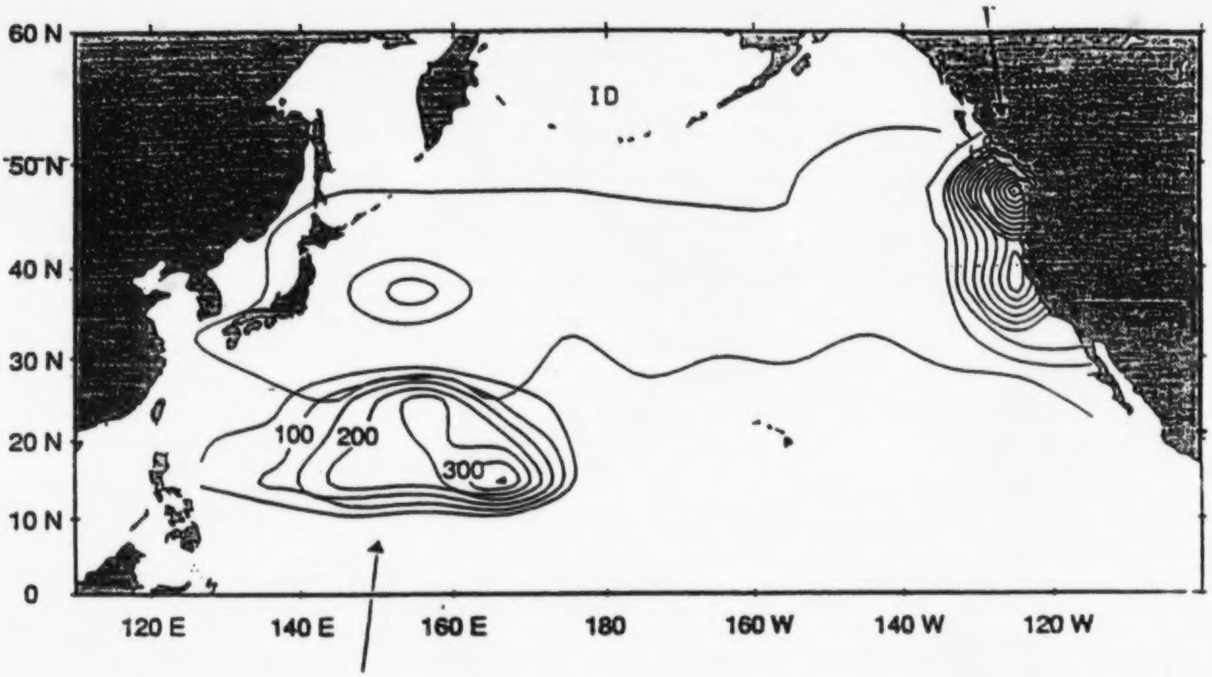
60 N
50 N
40 N
30 N
20 N
10 N
0
120 E
140 E
160 E
180
160 W
140 W
120 W
ID
100
200
300

Fig. 2 Distribution of albacore larvae (off Southeast Asia) and of Age 3 juveniles (off California)

extensive layers close to deep-water thermoclines. Standing stocks of mesopelagics of the order of 100 million t have been estimated (very provisionally) by acoustic surveys, e.g., in the northern Arabian Sea. In the case of squid populations, there are imprecise biomass figures, but based on very high estimates of consumption rates of some formerly abundant whale populations which relied heavily on squid for their diet, any 'surplus' productivity, given current low population sizes of squid feeding mammals such as sperm whales, could be significant. The same argument has been used with respect to Antarctic krill, although here there is evidence that following the severe decline of large krill-eating whales, populations of smaller krill-eating organisms, such as small whales, seals and birds, may have expanded to harvest the krill surplus left after decline of large whale populations.

18. Fisheries for pelagic and anadromous resources are taking place on the high seas, such as for many tunas, sharks, squid and salmon populations in the Indo-Pacific and Atlantic Oceans. The tuna stocks are regarded as falling under the highly migratory provisions of UNCLOS: the salmons under the provisions for anadromous species; returning to spawn in rivers within specific national territories. Species in either category are available to capture on the high seas, as are some anadromous species, contrary to the provisions of UNCLOS, which restrict the right of capture to the coastal State of origin.

19. Although the range of distribution and/or migration routes of many of these resources of the surface waters of the oceans are poorly known, as noted, many are in effect, straddling stocks. The populations concerned may thus coincide only partly with the area of competence of specific fishery commissions charged with regulating their overall harvests. This also applies for krill and other components of the Antarctic food web, such as marine mammals which may lie both within and partly to the north of the CCAMLR regulation area. Important also in this connection is the very uncertain and controversial level of by-catch in many of these fisheries of potentially commercial undersized or regulated species, and of endangered or otherwise politically undesirable bycatches; these also often discarded at sea.

20. In most cases, the true situation of these resources can only be inferred, given the fragmentary nature of information collection on the high seas. The problem of developing strategies for monitoring high seas resources, especially straddling stocks, is one of developing cooperative frameworks between different jurisdictions and, if necessary, creating new structures or mechanisms for filling the serious gap in information that now prevails.

ASSESSMENT OF OFFSHORE RESOURCES AND ASSOCIATED RESEARCH REQUIREMENTS

21. Management for optimal exploitation and conservation of high seas resources, as for living marine resources elsewhere, depends on being able to identify the limits of the unit resource as a self-reproducing entity within its own geographic range. This prime requirement needs to be stressed and will require research mechanisms such as coordinated tagging programmes, the use of remote sensing to map oceanic fronts and other suitable fish habitat, and widespread adaptation of fishing vessels as research platforms to provide objective data. All of these requirements will need careful study and evaluation.

22. Assessing the state of high seas resources also depends on having, or being able to deduce, information on the level and demographic structure of removals, the size of the resource, and the capacity of the resource to withstand exploitation.

CURRENT STATE OF INFORMATION FOR ASSESSMENT OF HIGH SEAS RESOURCES

23. At present, it must be said that for most oceanic species there is insufficient information and inadequate data on the identity of most unit stocks, on the boundaries of their ranges. Nor are there adequate data on the catch removed from each unit stock, the by-catches and discards, or the level of fishing effort applied. In some cases, such as some tunas, large whales,

some squids and offshore demersals such as Alaska pollock, there is fragmentary information which allows the exploitation rate to be roughly estimated but rarely, if at all, can reliable estimates of population biomass or total numbers be deduced with reasonable levels of accuracy. In the case of sharks, small cetaceans, most squids, and potentially valuable by-catch species such as pomfret, quantitative information is almost non-existent.

24. Rather than absolute estimates of abundance then, assessment work is usually aimed more at determining trends in abundance. These in turn depend to a large extent on the validity of trends in overall catch rate that again are based, for the most part, on data provided by the fishing fleets. Although there are still uncertainties about the distribution and migration of some species and on the optimal method of control and surveillance, the assessment framework that seems to offer most opportunities for management in circumstances of reduced data availability appears to be one based on 'boxes', framing area/season 'windows' of critical importance. These critical areas could be used in a precautionary fashion to close them to fishing during known periods of biological importance to the life histories of the species concerned.

25. Catch rate information (catch per set or per day) is a measure of abundance which could be derived from reported data if logbooks were completed and reliable, but catch rate tends also to reflect local high densities fished, and even where time series of catch data are available, these are not necessarily good indications of trends in population size.

26. Knowing the standardized level of annual effort would be a valuable right of control of likely trends in exploitation rate but such data are, to a large extent, dependent on volunteer reporting by fishing skippers. Such schemes are inadequate to provide data on the fishing location of highly mobile fleets, which may successively target different areas and stocks, may accumulate catches from several jurisdictions, and may often tranship partly processed catch at sea. The current data retrieval schemes therefore contain a significant but unmeasurable element of error, not only with respect to the annual summed effort by the fleets on a given stock, but even on the size and provenance of the catches.

27. In the case of transboundary stocks, there is the added complication that stock assessment theory requires that all catches and effort be pooled from all fleets before attempting an assessment. Mechanisms to do this for catches within and outside national jurisdiction (i.e., to fishery commissions) are currently not well developed.

28. The current situation is then one of fragmentary and possibly biased data, largely resulting from information volunteered by fishermen through logbooks, port interviews and radio reporting. An emphasis is now being placed on decision-making under conditions of uncertainty: unfortunately, this requires for stock conservation under these conditions, a highly conservative policy with respect to the level of harvesting allowed. Management by control of access in theory would be feasible, but currently there is an absence of objective, adequate and verifiable information on the resources and on fleet operations. These have been factors which have led to the implicit application of the Precautionary Principle, by the General Assembly of the United Nations in the case of the high seas large-scale driftnet fishery. It is clearly unacceptable for a new industrial fishery to develop in the absence of a corresponding objective data collection system, since such fisheries may exert heavy pressure on the stocks before the necessary data for an evaluation can be obtained. Perhaps the more fundamental lesson to be learned by the fishing industry from the last experience is that there is a positive advantage, both for the industry and conservation interests, in adopting sustainable fishing practices and in having an objective system of recording catches taken in the course of offshore fishing operations.

29. Further refinement of scientific advice towards developing objective resource management measures is obviously in the long-term interests of both fishermen and conservationists, but will apparently require application of

technological advances that are currently feasible and, as discussed in the next section, these possibilities are regarded as having a high priority.

TECHNOLOGICAL ISSUES

30. In an ideal world, knowing the total catch and standardized total effort exerted on a stock would allow an estimate of global, as opposed to local, catch rate for the stock. If supplemented by biological sampling of the catch for sizes and/or ages, this in turn would allow population and recruitment trends to be inferred with some reliability.

31. The majority of the needs for objective data on the number and location of fishing operations and the total removals would, in theory, be satisfied if three provisions could be realized:

(i) the installation of a tamper-free 'black box' system (transponders) on board as a requirement for licensing of distant-water vessels. This 'box' would directly monitor fishing location, deck machinery operations, and provide objective data on other relevant activities. It would report in real time via satellite to a central location, with appropriate legal provisions in the case of evasion of these conditions for granting an international high seas fishing licence.

(ii) the possibility of identifying the provenance of the catch from a given time/location through all subsequent transshipment and offloading operations, with biological sampling of the catch referable back to the date and place of original catch, will be essential to identifying catches to the stock of origin.

(iii) bycatch problems will have to be addressed by regulation, but there must also be gear research to reduce bycatch incidence. A system of seasonally closed areas to minimize, to the extent possible, undesirable side-effects of fishing must be developed. This should take into account seasonally-overlapping species ranges.

32. If such a system were realizable, and if (for straddling stocks) corresponding information could be obtained on removals from inside EEZs, the requirement for objective assessment of high seas resources would have the possibility of being satisfied.

ECONOMIC ASPECTS

33. High seas fisheries make notable contributions to incomes, employment and fish supplies in the countries whose fleets are engaged in such fisheries, but it is less certain that they are always economically viable without subsidies. They are economically important also for backward and forward industries, particularly shipbuilding and fish-processing industries.

34. The exacting requirements in terms of technology, capital and specialized fishing skills for developing an offshore fleet have limited the number of countries and entrepreneurs which engage in the exploitation of otherwise open-access high seas resources. In many instances, high seas fishing is performed seasonally by vessels which also exploit resources within their own or other countries' EEZs, and there is not always a clear distinction made between catches coming from these two types of areas.

35. The information available on the economics of high seas fisheries is also limited. Estimates of the economic performance are made difficult due to the fact that most large-scale industrialized fisheries are subsidized by various measures, including soft loans, grants, and the provision of subsidized onshore infrastructure and facilities.

36. High seas vessels may compete with national fleets over resources which occur both in the EEZ and beyond. Where a resource can be exploited within the EEZ of a country, the harvesting of that resource on the high seas is likely

to be more costly than within the EEZ, because steaming times are longer and catch rates may be lower offshore. However, differences in wages, in demand for fish on national markets, and in the levels of government support, may all, to varying degrees, offset these differences.

37. In the exploitation of certain resources, including tunas and squid, there are likely to exist significant economies of scale, and the operation of a fleet of vessels is more profitable than the operation of individual vessels. This is an impediment to entry into such fisheries by countries with limited financial resources.

38. Different kinds of management measures geared toward reducing mortalities of non-target species may have different consequences on the economic performance of high seas fisheries. The selection of management methods, therefore, needs to take into account the operational requirements of fishing vessels.

RESEARCH ISSUES

Biological productivity of oceans

39. In general, there is a need in the case of straddling demersal stocks to clarify the extent of the stocks, their spawning, juvenile and feeding areas, and their migration routes. The impact of fishing outside the contiguous EEZ on the stocks within national jurisdiction will need to be evaluated. In order to do this, a mechanism to support research and survey activities outside EEZs is required, leading to a better estimation of sustainable exploitation rates, biomasses and spawning/nursery areas. Close coordination of these costly data-gathering mechanisms with parallel efforts aimed at global ecosystem monitoring will be needed for cost-effective implementation.

40. For oceanic pelagics, some more precise mapping and delineation of stock ranges by season and area, and of migration routes will also be needed. Specialized mechanisms, such as cooperative tagging programmes and use of remote sensing to identify critical oceanographic conditions for fish concentration, will be required.

41. The trade-off between harvesting different levels in the oceanic food chain needs to be better understood, and acceptable levels of impact defined: for example, does the harvesting of a given percentage of squid or krill have effects on the viability of populations of larger marine organisms in part dependent on them for food?

Incidental catches of non-target species

42. A better understanding of the vulnerability of species caught incidentally to harvesting, and how gear design, method of deployment, and locality and season affect bycatch, will require more extensive on-board observation from fishing/charter vessels.

Oceanic pollution

43. A better understanding of the impact of artificial debris (including ghost-fishing by lost gear) on oceanic organisms needs to be obtained.

Technological questions

44. If the technological problems in monitoring location of harvesting activities within circumscribed oceanic areas can be solved (see paragraph 31), a potentially efficient conservation mechanism would be to seasonally or permanently block access of fishing fleets to at least a fraction of those areas which are of key importance to oceanic species. A better understanding of these 'critical oceanic habitats' within larger ocean systems, and how they change seasonally and by area, is needed. This is not primarily to improve efficiency of harvesting operations, but to provide the basis for a possible

restriction of suitable fishing areas which do not encompass all such areas of importance for a species.

Economic Research

45. The establishment of a management regime for the high seas will have to be based on economic considerations, including explicit provisions for a systematic research programme. According to normal requirements for any economically self-sustaining activity, this implies that there is a management authority capturing a source of revenue from economic activities within the area, including those, for example, from fishing licences. In principle then, there is no difference between the economic analysis needed for the management of fishery resources within EEZs or on the high seas. Data would be needed on harvesting costs by different types of vessels and fisheries, on amounts landed by species, and on fish prices.

46. The needs for socio-economic analysis would be somewhat more restricted, and would have to focus on the impacts on costs and benefits of an additional source of fish extraneous to that available within the EEZ, on employment prospects and revenues in the fish processing and distribution sectors, and on markets. The dependency of certain input industries, e.g., shipbuilding and repair, refrigeration and transport for such fisheries, would also be a relevant consideration for management decision-making.

47. A significant difference in the economics of fisheries operations presumably exists between high seas fleets and those harvesting in national waters, and between high seas fleets from different countries. In the former case, a much higher catch rate would be needed to make up for the higher costs of deep water and distant-water fishing. Other considerations may be relevant, however, such as a perception that offshore fish are less subject to pollution-related effects or contamination than nearshore resources.

SUGGESTED ACTION BY THE TECHNICAL CONSULTATION

48. In reviewing this paper, the Consultation is invited to determine the type of research required for sustainable fisheries of the high seas and any action which should be taken with regard to the implementation and coordination of research.

RESPONSIBLE FISHING PRACTICES FOR THE HIGH SEAS

INTRODUCTION

1. For the purpose of this document, the high seas are considered to lie outside exclusive economic zones (EEZs) or waters over which a coastal State may have jurisdiction and, since many relatively shallow sea areas and seamounts fall within this definition, no depth limitations are set and no class of fishing vessel or fishing gear and methods are excluded.

2. Whereas the high seas are normally seen to be less productive than EEZs, there are areas where biological production is concentrated and straddling stocks are a case in point. In addition, there are some substantial stocks of under utilized species in deep waters off some continental shelves.

3. In general, the high seas are host to a few hundred species, many of which are commercially valuable and the fishing gears and methods used depend on the density of the stocks, their place in the water column and the regulations in force if any. Many of these fishing gears and methods are no different to those used within EEZs.

FISHING METHODS ON THE HIGH SEAS

4. Purse-seining for large oceanic pelagic fish (mainly tuna) was initiated in the Eastern Pacific in the 1960s, and subsequently spread to the Western Pacific in the 1970s and the Indian Ocean in the 1980s. The vessels used have become progressively very large, and now employ helicopters or aircraft to spot the schools and guide the vessels during the fishing operation. Remote sensing techniques are also used to identify areas of opportunity and so reduce searching time. These are some of the largest fishing vessels in the world and many of the them operate under open registers. The changes in the rights and responsibilities of governments as a consequence of the UN Convention on the Law of the Sea greatly affected the operations of these vessels which have now to pay licensing fees to operate in areas that were previously regarded as high seas.

5. Gillnetting on the high seas began in the 1950s in the Pacific with salmon as the main target species. Bilateral agreements, between Japan on the one hand and the USA and Canada on the other, gradually reduced the areas in which the driftnet vessels could fish for salmon and the vessels then targeted tunas and more recently squid. In the last decade, the Japanese vessels have been joined by vessels from North and South Korea and vessels from Taiwan, Province of China.

6. Longlining for tuna has been a prerogative of Asian countries for many years, and they fish throughout the world for the large pelagic tunas. The technology used is advanced and a large proportion of the individual fish are frozen quickly to maintain the high quality required for the sashimi market.

7. Squid-jigging is also a method which is used almost exclusively by the Japanese on the high seas. Light attraction is an integral part of this fishing method to aggregate the squid into fishable schools.

8. Pole and line fishing for tunas and mackerels was used to great effect in the past (i.e., prior to the 1960s), but has now been superseded by purse-seining and gillnetting. It is still carried out by artisanal fleets inside EEZs.

9. More recently, midwater trawling has been used in the Atlantic by French pair trawlers fishing for albacore using very large nets and midwater trawling is used to catch krill in the Antarctic and for small pelagics off West Africa.

10. Bottom trawling is used for many straddling stocks on extended continental shelves and slopes and sea mounts, falling within the definition of high seas.

SPECIES FISHED ON THE HIGH SEAS

11. Tuna is one of the most important target species and is an apical predator nearly at the top of the trophic pyramid with sharks and sea mammals (and man) as its only predators.

12. Oceanic squid are one of the few remaining species with large potential regarded as under-exploited in some areas. The traditional fishing method is by light attraction and jigging by automatic machines, but more recently gill- or tangle-netting has become more common. When available to trawling, oceanic squids move too quickly to be caught by this gear under normal conditions. Trawling is, however, usable for neritic squid stocks.

13. Salmon used to be harvested in the Central Pacific, but because the provisions of UNCLOS and bilateral agreements on anadromous stocks, the fish are now harvested by the riparian countries on return to their home rivers. For the Atlantic, the North Atlantic Salmon Conservation Organization (NASCO) is the forum for such agreements; yet the stocks continue to decline and urgent action is required to effect further controls. With this in mind, similar controls would also be needed if the efforts to introduce salmon to some South American rivers are to succeed with respect to the South Pacific.

14. Hake, cod and pollack are among the species to be taken in areas where there are straddling stocks. For example, off the East coast of Canada (NAFO area), 15 of the 42 groundfish species managed in the North West Atlantic overlap or are outside the 200 mile limit. A similar situation exists in the Southwest Atlantic for hake and for horse mackerel off Chile and Peru.

PROBLEM AREAS IN HIGH-SEAS FISHERIES

15. The main problem is lack of a clearly defined management system for the high seas under UNCLOS which proposes administration by regional fisheries bodies. No coordination mechanism presently exists whereby regional bodies can act in a cohesive manner for broad high seas issues. Membership in regional fishery bodies tends to bind the Member Countries to the decisions taken but does not give them the authority to deny the right to fish by countries not members of the bodies and not complying with regional regulations. This has been one of the factors which has led to "flagging out" of vessels of contracting parties in efforts of owners to bypass quota systems and other constraining regulations.

16. In the open access conditions still prevailing in most EEZs, over-investment and overfishing puts considerable pressure on fishermen to fish where they can earn a living since the majority have no access to alternative employment and these vessels cannot be used to any great extent in alternative business opportunities. This has most certainly contributed to fishing vessel owners seeking fishing grounds in the high seas and to register their vessel where it is more convenient and in particular, under the flags of non-contracting parties to high seas fisheries agreements. The practice leads to less than responsible activities through the use of less selective gear than that required by the contracting parties and fishing at a time in the life cycle of the resources when it is counterproductive to do so.

17. An additional problem arises from "flagging out" in that data collection on fishing effort and catches is frustrated by inaccurate information of numbers of vessels actually fishing, the amount of and type of gear deployed and the fact that the catch is often transhipped at sea or through an accommodating port. Under such conditions, the best available scientific information, as required for management purposes, can hardly be appropriate.

18. A further problem arises in that, although UNCLOS allows any country to harvest the marine resources of the high seas, in practice fishing is limited to those countries which have the industrial technology and expertise to keep fairly large vessels at sea. This in effect restricts access to the high seas by developing countries.

19. Perhaps the first problem relating to the use of living resources emerged in the 1960s with the incidental catch of dolphins and porpoises in purse seines, when seines were set on porpoise-associated tuna schools in the Eastern Pacific. The problem was significantly mitigated by implementing a combination of gear modifications and fishing manoeuvres. Purse seines were modified with the addition of Medina panels and Superaprons so that in the final phase of pursing the porpoises could be spilled out of the net in a "backdown manoeuvre" which left the deeper swimming tuna in the net. Government-imposed reductions in the incidental catch of porpoises ensure that efforts continue to further reduce the kill by improving the fishing method and, by sensitizing the fishermen to environmental issues.

20. Longlines have been implicated in the deaths of seabirds which eat the baited hook while the line is being set. While the real impact on the bird populations is not accurately known, the victims might include some rare seabirds (some of which are endangered species). The use of tori poles, which stream a line of detractors astern of the vessel and thereby scare the birds away from the baited hooks thus allowing the line to sink to a safe depth, is reported to have very good results.

21. Large-scale pelagic driftnets for tuna and squid have attracted the greatest attention with regard to biological impacts on the high seas culminating in the UN resolution 44/225, suspending their use on the high seas.

22. Ghost fishing by lost or abandoned fishing gear has also been attributed to the deaths of dolphins, turtles and sea birds and, although there are differing opinions on the length of time such gear will continue to fish, there is ample evidence of the entanglement of the species in question.

23. Some countries have vessels fishing for krill in Antarctic waters. Although the present removals are still fairly small, the potential development of this fishery raises the question of food supplies for the recovering cetacean stocks expected as a result from the whaling moratorium. It has been argued that if the harvesting of krill is not limited, it could have a detrimental effect on the rate of recovery of those cetaceans, particularly the larger species.

24. The fishing effort on straddling stocks is claimed by most of the coastal States concerned to be excessive and to have a detrimental effect on the state of resources within their EEZs. It is also claimed that the fishing gear used is not selective enough to allow the escape of juveniles of the target species and to reduce waste. In addition, bottom trawling is said to cause environmental damage.

25. Oceanic resources represent a large part of the resources available to small island States which have claimed that they were adversely affected by fishing interventions on the high seas, particularly in the case of migratory stocks which are reduced and dispersed when they pass through their waters. In some cases this forces the fishermen to operate farther afield exposing them to greater danger and increasing their costs of operations; in other cases, island fishermen are in conflict with sports-fishermen, particularly when the small island State relies heavily on tourism. Either way, this increases the hardship of fishermen and often forces them into illegal practices to make a living.

26. The increase in activities on the high seas has also brought problems associated with operating long distances from home ports with respect to conditions of work and service and to safety. Long periods at sea and long working hours often lead to accidents and lengthy periods between leave, poor pay, insurance and pensions are generally below the minimum standards set out in the relevant ILO conventions. Here again, registration under an open registry does not help the fishermen to fight for better conditions. For the vessel owner, the lower operation costs are attractive; to the fishermen, there is more need to fish as much as possible in order to earn the best possible wage.

27. With regard to safety, the fishermen are poorly covered under the Convention on Safety of Life at Sea (SOLAS) and, to date, the only International Convention concerned solely with fishing vessels (Torremolinos 1977) is not in force. Furthermore, the proposed Protocol to this convention, scheduled to be debated at a conference in 1993 would only cover less than one percent of all the fishing craft in the world if it comes into force.

28. Another problem is that fisheries administrations are not usually associated with Ministries responsible for sea transport. Consequently many fisheries administrations do not participate at meetings of the International Maritime Organization (IMO) where conventions related to safety at sea are formulated. This may be one reason why there are instances where the cover for fishing vessels under Maritime Search and Rescue is incomplete and this is often due to lack of appreciation of the requirements for search and rescue. Search and rescue operations are made difficult when the position of many vessels is not known due to the operating practice of some owners. Even when the position is known, many vessels are not readily identified due to the lack of suitable markings.

POSSIBLE TECHNICAL SOLUTIONS

29. The technological solution to the high seas gillnet problem hinges on the visibility or otherwise of the webbing of the gillnet to the non-target species which forms the incidental catch. In attempting to make the net less visible by sight to the target species, the net has become invisible to the sonar system of sea mammals. Nylon has a slightly higher density than water and this has been regarded as an advantage in that it does not need many floats or weights to keep the net vertical in the water. However, it has the disadvantage of becoming less visible to the sonar system of sea mammals. Assuming that the target strength of a material is related to its density, a material such as polyvinylidene chloride would have five times the target strength of nylon. The problem could be resolved by manufacturing polyvinylidene chloride so it had the same catching efficiency as nylon; such a solution, however, presents the manufacturing industry with an attendant problem if an increase in density is associated with an increase in light refraction.

30. Other methods under investigation to reduce incidental catch in gillnets are:

(i) scaring devices
(ii) submerging the headline to leave a free column of water between the headline and the surface
(iii) patrolling the nets to remove entangled cetaceans as soon as they enter the net.

31. The catch of sea mammals also could be reduced by studying their behaviour and applying the results to modify fishing operations. Behaviourial traits that might merit further investigation are:

(i) most sea mammals are active during particular times of the day, being relatively dormant during the night and around noon. By confining fishing activities to these periods, the incidental catch relative to the fishing effort could be reduced significantly;

(ii) there is evidence that, while swimming in the open sea, marine mammals utilize their sonar capabilities infrequently. However, if they sense danger the sonar senses are rapidly brought into action with the rapidity of the sonar 'clicks' increasing to a maximum. A method of alerting the sea mammals to the presence of nets could also result in a reduction of incidental catch and such devices are in use in coastal areas; further development may be needed with respect to frequency/range;

(iii) since light has a significant effect on most marine animals, more investigations should be carried out on light intensity and frequency.

32. The behaviour of oceanic turtles should also be investigated in order to develop methods to prevent their entanglement in fishing gear.

33. Mobile gear (bottom and midwater) could be improved with respect to selectivity in order to improve the escape and survival rates of juveniles of target species (and the escape of non-target species). The answer may not be to simply increase the mesh size in the case of the more normal diamond mesh, since the gear, including the codend has been seen to react like a spring and consequently the mesh shape alters during a tow. One possibility would be to make more use of square mesh which can be rigged to hold its shape. The reduction in strength can be offset by using ropes along the length of the codend to take the strain. In addition, grid systems, using slotted metal or plastic plates can be used in some fisheries.

34. Until recently, most of the selection was effected in or just before the codend but this need not be the case. Horizontal panels, dividing the net into two sections (not necessarily equal sections) has given good results in some fisheries and there is great interest in starting the selection process further forward in the net.

35. In addition to selective devices built into fishing gear, the method of rigging the gear is also important. Recent developments in Australia have shown that a bottom trawl can be environmentally friendly, taking catches of the target species without undue disturbance of the sea bottom. In Canada, a semi-pelagic trawl of unique design has been tested that would also be environmentally friendly and yet fish extremely close to the bottom.

36. It is also essential to study fish behaviour in a particular fishery for which gear regulations are being considered since it has been shown that the reaction of some species to fishing can differ from one geographical area to another. For such studies, the use of underwater photography is imperative. The technology exists and standard low light units are readily available. For deep water operations, as would be the case for some under-utilized species, special arrangements would be necessary.

37. The actual selection of the system to be adopted should be preceded by thorough testing under commercial fishing conditions. In this respect, the full involvement of the fishing industry/fishermen from an early stage is essential.

38. However it is not only the design of the fishing gear that has to be addressed. There are other practices, if adhered to, that would greatly improve the possibility to achieve the sustainability of the resources and economic levels of fishing effort. Every effort should be made to ensure that each population is harvested in areas and at the stage of its life cycle consistent with the basic principles of a renewable resource (with due regard to economic efficiency).

AIDS TO MANAGEMENT AND CONTROL

39. The Declaration of Cancún, which was delivered on 8 May 1992 by the International Conference on Responsible Fishing, Mexico, 6 to 8 May 1992, states in paragraph 11 that "States should cooperate on bilateral, regional and multilateral levels to establish, reinforce and implement effective means and mechanisms to ensure responsible fishing on the high seas, in accordance with relevant provisions of UNCLOS". The Conference agreed further to request the Director-General of FAO, in consultation with relevant organizations, to develop a Code of Conduct on Responsible Fishing. By definition, such a code would encompass all fisheries and thus "the Code" should provide the basis for acceptance of a common standard for good fishing practices on the high seas.

40. In order to bring a more responsible approach to safety of life at sea, conditions of work and service and protection of the environment, a code of

conduct for responsible fishing should address related international conventions concerning, inter alia:

- (i) safety of life at sea (SOLAS),
- (ii) safety of navigation (Collision Regulations),
- (iii) fishing vessel safety (Torremolinos Convention),
- (iv) prevention of pollution of the seas from ships (MARPOL),
- (v) control over dumping at sea (London Dumping Convention),
- (vi) prevention of atmospheric pollution (Montreal Protocol to the Vienna Convention),
- (vii) conditions of work and service in the fishing industry (various ILO conventions) and,
- (viii) conduct of fishing (various conventions).

41. Fisheries management could also be enhanced through the provision in the code for standards and guidelines to be followed on a number of issues, such as registration, identification of vessels and gear, how to prevent pollution of the marine environment (and reduce ghost fishing) and to prepare administrations and fishing vessel owners to meet their obligations under pertinent Conventions. An example of such standards and guidelines would be:

(i) The Standard Specifications for the Marking of Fishing Vessels (adopted by the FAO Committee on Fisheries in 1989) which are an aid to management and safety at sea; the system of using the international radio call sign is an ideal base for a regional registration system; it could also be used for States to report to the competent international organization which could establish a global database for vessels authorized to operate on the high seas.

(ii) The Marking of Fishing Gear and Fishing Implements is currently under review by the FAO regional bodies and by IMO. This provides a mechanism for the identification of ownership of the gear, the identification of the position of the gear in the sea (aid to safety of navigation) and serves to respond to Annex V of MARPOL. The system allows for registers to be maintained of the gear marks.

(iii) Energy optimization and the reduction of harmful emissions in exhaust gases. This is currently before the International Working Group on Energy Optimization and the objectives of the standards are to make more rational use of energy in fishing operations and to comply with the Montreal Protocol to the Vienna Convention by providing the technical guidelines to reduce the emissions of carbon dioxide, nitrous oxide, sulphurous oxides and carbon particles.

(iv) Prevention of Pollution at Fisheries Harbours and Landing Places. These standards and guidelines are in the early stages of development by FAO with the cooperation of IMO; the aim is self explanatory and would be achieved, in part, by more responsible operations on the part of fishing vessel owners and fishermen, as well as processing plant managers.

42. Management could also be enhanced through the introduction of acceptable guidelines to set international standards related to fisheries research and monitoring control and surveillance (MCS). These could include, inter alia:

(i) The Conduct of Fisheries Research Vessels operating in the waters of States other than those of the flag State. The adoption of such a code would ensure common practice with regard to Article 249 of UNCLOS which outlines the conditions which have to be met by foreign research vessels when undertaking marine scientific research in the EEZ or continental shelf of a coastal State. These conditions include the obligation of the foreign research vessel to provide the results of such research and survey, including their assessment and interpretation, to the coastal State, if so requested. This principle of dissemination of scientific information could also be extended to cooperation on the high seas.

(ii) Since fisheries administrations are not necessarily the authority concerned with the removal of redundant offshore structures or, surprisingly, the creation of artificial reefs as a beneficial use of matter to be dumped at sea, particular attention should be given to a code to ensure the interest of fisheries. For this reason, the guidelines developed for offshore structures by IMO and, the guidelines to be developed under the London Dumping Convention, with the assistance of FAO, would be part of the reference material to a code of practice for responsible fishing management.

(iii) International standards could be developed to include a code of practice for MCS operations, training of officers for scientific observation and enforcement and guidelines prepared for international cooperation in MCS operations.

43. The Code of Conduct on Responsible Fishing would also refer to other management measures requiring the use of advanced technology and the extent to which this could be applied would vary with the complexity of the management control envisaged. It would also be possible to formulate the Code in such a manner to provide technology options for different fisheries; for the high seas, such options could include:

(i) mandatory use of remotely sensed position indicating devices for fishing vessels and certain types of fishing gear,

(ii) automatic logging of length of gear deployed per set (i.e., longlines),

(iii) automatic logging of trawl gear performance (i.e., depth, towing time, data from cod end sensors),

(iv) machinery performance recorders (to include running hours, speed graphs, fuel consumption, CO_2 emissions etc.,),

(v) freezing and storage temperatures of the catch,

(vi) manual logging in of catch data to storage/ transmitting systems by shipboard staff/observers; the basic maintenance of log books in an appropriate format to be a requirement in any event.

44. Data so collected can be retrieved in real time on a continuous basis or as required by monitoring stations ashore or afloat; the latter implies that MCS/fishery protection vessels are suitably equipped and that the officers are adequately trained.

45. The technology to perform the above functions is currently in use by many of the managers of the merchant fleets of the world for voyage management and maintenance systems and many fishing vessels are being fitted with the type of equipment required to generate the data mentioned in para 43. Satellite navigation is common place, high quality echo sounders/sonars are in use, fuel monitoring (ISIS) is also widely used and acoustic net monitoring equipment is becoming popular (and essential for automatic trawling systems). For the simplest systems, the costs to vessel owners are relatively low for most classes of vessels. Naturally more sophisticated systems could be costly especially in the case of retrofits but in comparison with the capital

employed (and benefits obtained) they could well be affordable. Nevertheless, management may have to face a need for subsidy and a phasing-in period for the introduction of such equipment.

46. As seen in merchant marine operations, regulations must be backed up by a thoroughly professional management unit with adequate resources in the form of manpower, equipment and funding. In addition, all concerned must be well trained and made aware of their respective roles. They must be aware of the needs for the regulations, the long-term benefits to be accrued from responsible fishing and, the penalties for non-compliance.

47. The above-mentioned awareness programmes imply that education must start at an early age and that training programmes are properly developed. In this respect, it should be noted that under the Protocol to the Torremolinos Convention on the Safety of Fishing Vessels, there is a provision for the carriage on board of vessels, of training manuals (and where applicable audio-visual materials) concerning safety and the prevention of marine pollution.

48. Compliance with appropriate fisheries regulations governing the sum of the gear deployed in space and time and with the laws of nature is the key to responsible fishing.

SUGGESTED ACTION BY THE TECHNICAL CONSULTATION

49. In reviewing this paper, the Consultation is invited to consider proposals for the elaboration of guidelines or of a code of conduct/practice for responsible fishing which, as recommended by COFI, should take into account all the technical, socio-economic and environmental factors involved.

HIGH SEAS FISHERIES MANAGEMENT: NEW CONCEPTS AND TECHNIQUES

INTRODUCTION

1. The main uses of the high seas include transportation, fisheries, dumping, research and defence. Although dumping may represent a problem in the future and transportation comes occasionally into conflict with fisheries, the most pressing issue today is the poor management of certain high seas fisheries which affects social and economic sustainability as well as the environment and even the survival of some species.

2. Extension of jurisdiction and adoption of the UN Convention on the Law of the Sea (UNCLOS) in 1982 continued a process which started in the 1940s following the rapid expansion of long-range fleets, the concern about the state of the resources and a rising disagreement among coastal developing countries with the existing allocation of marine fishery resources. UNCLOS formalized a new distribution of wealth and provided a useful framework for management of the ocean resources which, in the last decade has proven to be insufficient, by itself, to prevent resources degradation and promote long-term economic efficiency.

3. The principal high seas resources and our knowledge on their status are presented below as introduction to a survey of the main management issues presented for discussion at the Technical Consultation.

STATUS OF HIGH SEAS RESOURCES

4. High seas resources include about 400 potentially commercial species, including highly migratory and straddling species, which spend part or all of their life cycle beyond the 200-mile limit, and available biological information is generally poor (except for tunas and some large whales). Few species are subject to aimed fishing. Tunas, salmon, sharks, billfish and squid are the main targets together with some limited demersal resources extending outside the 200-mile limit. New fisheries are possible for a few important resources. Oceanic squid and mesopelagic fish and krill still have significant unused potential but, given low unit values, high costs of fuel and the high level of harvesting technology required, net economic yield may not be great.

5. Apical predators, such as tunas, cetaceans or sharks, integrate the entire oceanic food chain and make it available to man in a high value, accessible form. Few prey species are intensively exploited (e.g., squid, krill, blue whiting) because of high fishing costs, low market prices, or low densities. Elimination of an apical predator does not always lead to a major increase in the yield of their prey. On the other hand, there is a degree of competition between man and other apical predators for their common prey. Controversy surrounds the degree to which this postulated competition is real and affects the fishery and the recovery of endangered species.

6. Most baleen whales and sperm whales are heavily overfished or depleted with some rare exceptions and some species may be beyond recovery. Smaller cetaceans (toothed whales and dolphins) represent a potentially serious management problem but may also be considered by certain developing countries as a potential for development.

7. Most prime tuna stocks in temperate or tropical waters are under heavy pressure and are intensively-to-fully fished locally. Gross overfishing has been avoided because of economic constraints and transfer of effort to (a) younger age groups at the surface, (b) offshore hydrographic areas such as domes and fronts, (c) other less exploited species and (d) other oceans. Extension of tuna fishing into the Southern Ocean, on slender tuna, may be the next and last possible move. With the emergence of the dolphin problem, tuna fisheries are facing new constraints. Competition between traditional and emerging tuna fishing powers in developing countries is increasing and the control of international effort levels will soon become a major problem. In the absence of explicit considerations of "equitable" allocation of resources,

conflicts are bound to increase, and there are attempts to re-open the question of the rights and responsibility of coastal countries in managing these species in their exclusive economic zones (EEZs) (cf. Article 64 of UNCLOS).

8. Wild salmon streams have been very severely damaged. Offshore, high seas protection must be improved respecting the agreed rights of the countries of origin. Inland pollution and degradation of spawning grounds must be stopped. Overall, with environmental rehabilitation and stocking programmes, the future of salmon looks bright provided production does not offset the demand. Ocean productivity is limited, putting an upper limit to its salmon-rearing capacity and, in the absence of agreement, States may compete for it by intensifying their ranching industry. Many questions remain to be answered: When will ocean saturation be reached? What would be the effect on competing resources (squids, pomfrets etc.) and predators (seals, sharks, etc.)? What will be the effect of offshore competition between wild and cultured strains?

9. Oceanic squids seem to offer a great potential for development on new species and areas while the main species already targeted are fully fished. With the recent conflicts about driftnetting, possibilities to develop commercial fisheries are limited but not non-existent. The oceanic sharks might be more a source of concern than of sustainable development, and research on these species is badly needed. The oceanic horse mackerel appears heavily fished locally. Its future is obscured by the lack of an international mechanism for its management and cooperation in research and coastal countries are presently expressing their unease.

10. Antarctic commercial species are seriously depleted and management performance is not yet convincing. Krill is the exception, saved probably by the difficulty to use it profitably. The ecosystem management concept has still to be put into practical application.

11. Straddling demersal resources on extended continental shelves are fully fished if not overfished and conflict is rising between distant-water fishing nations and coastal countries about their management.

MANAGEMENT ISSUES

Data and information

12. The fishery data required for proper management of high seas fisheries are often not available or of dubious quality. The problem lies in fishermen's lack of cooperation, inadequate monitoring control and surveillance capacity and insufficient funding of regional fishery bodies. (The issue is dealt with in more detail in document FI/HSF/TC/92/2).

13. Better research is a major achievement of fishery management bodies but the scientific effort is still insufficient to ensure management under a reasonable level of uncertainty and risk. The problem relates to the inadequacy of fisheries data, to the cost of trans-oceanic research and to polarization on sensitive matters. Management-oriented research is required on ecosystem functioning, species interaction, stock structure and delimitation of management areas, stock migration, abundance indexes, reproduction, life cycles, reproductive strategies, bio-economic interactions between fisheries, resources allocation issues, seasonal and spatial fleet strategies, fleet dynamics and management under uncertainty. (The issue is discussed in more detail in document FI/HSF/TC/92/3).

Management reference points

14. Heavy fishing affects the abundance of target resources but may also change the relative abundance of associated species such as competitors for food, preys or predators. In absence of control, short-term economic interests and financial discount rates result in 'mining' of the reproductive capacity of species with low rates of replenishment, and in so-called 'pulse fishing'.

15. Maximum Sustainable Yield (MSY) strategies imply, in theory, that stocks are exploited at their level of maximum physical output and natural rate of increase, preserving highest resilience. Although the MSY concept figures prominently in UNCLOS and has been referred to by the UN Conference on Environment and Development (UNCED), it has become clear that this concept leads also to high instability, that it is not compatible with sustainable development of a multispecies resources or in an ecosystem context and that it fails to account for socio-economic properties of fisheries.

16. Maximum Economic Yield (MEY) strategies try to maximize net macro-economic output. They imply lower rates of capitalization, higher catch rates, and greater biological stability than MSY and in many cases MEY would be an even better target for conservation than MSY.

17. Optimum Sustainable Yield (OSY) strategies would, in theory, try to maximize net aggregated benefits addressing directly the social aspects of fisheries in addition to resources and economic issues. In UNCLOS, OSY is related to MSY as "qualified by relevant environmental and economic factors".

18. Other reference points and criteria must be developed and agreed to which relate to acceptable levels of impact and biologically safe limits and would be part of a strategy for precautionary management (see below). For single species fisheries, they could refer to $F_{0.1}$, $F_{2/3\,MSY}$, Minimal Reproductive Biomass (MRB), Maximum Rate of Recruitment (MRR). Similar reference points are needed for multispecies fisheries and for ecosystem management.

Monitoring, control and surveillance

19. Monitoring, control and surveillance (MCS) for high seas fishing activities are not provided for in UNCLOS. However, if mechanisms are agreed for high seas fisheries management, it will be necessary to seek innovative solutions to ensure that provisions are adhered to. The most appropriate and cost-effective means of ensuring that management measures are observed would be through flag-State enforcement. Concurrent with such an approach would be the need to mandate sanctions that would be adequate to deter violations and to maintain international confidence in management arrangements on the high seas.

20. Enforcement is the key to any management programme. Even the "simplest" management measures such as the prohibition of certain gears within specified areas (e.g., large-scale pelagic driftnets) require careful attention to detect non-compliance. The enforcement of sophisticated space/time fishing calendars requires accurate and quasi real-time knowledge on individual vessels behaviour and a credible interception or penalty capacity. This is a major problem with international high seas fisheries bodies. International monitoring, control and surveillance have not been particularly successful. Observer schemes are not without problems. The high coverage rate afforded by the Inter-American Tropical Tuna Commission to control dolphin bycatch may be costly and impractical in the high seas context.

21. Penalties for infringements, either by illegal fishing or pollution, should be commensurate with the illegal economic gains generated by the infraction.

22. National liability is a complex related issue addressed both at UNCLOS and UNCED. When flag States are not members of a commission or party to an international fishery agreement, UNCLOS does not mention any specific obligation to comply with the related regulations. These states are, nevertheless, under the obligation to comply with the measures that they have to take on the basis of their general duties for the conservation of high seas resources under UNCLOS (see Articles 117 to 119).

Regulations of access and fishing effort

23. The need to regulate effort and the problem of political constraints upon management of freely accessible resources has been recognized for decades. Since the late 1960s, regulation of fishing removals has become a

source of major concern and effort was indirectly regulated by means of total allowable catches (TACs), to be shared among the countries (quotas). This approach could theoretically help in resource conservation but failed to reduce economic waste or conflicts for access.

24. Economic and biological concerns for sustainability of fisheries are not conflicting in the long term. In the short term, however, these concepts are often at odds, especially when costly fleet reduction programmes must be undertaken. The cost of "trimming" fisheries could, in theory, be covered by the rents which will result from improved management provided these can be captured by an appropriate system of user fees. The problem is twofold: (1) the fishing industry may not be in a position to provide the finance initially required and the intervention of development banks and States is necessary to pay today the cost of future benefits, and (2) without an adequate system of user rights future benefits cannot be guaranteed under a system of open access.

25. Access to fisheries must be controlled and, in many cases, reduced to levels compatible with long-term productivity in order to preserve resources and generate rents. Measures usually recommended include *inter alia* the issuing of limited licences to fish, attributions of quantitative rights, low financial incentives to new participants, encouragement of group control with the allocation of exclusive user rights and the institution of closed areas or marine parks. Most of these measures cannot be effectively used in the high seas but some form of mutually agreed access limitations is needed.

26. Licence fees for use that affects the sustainability of the resource, either by illegal fishing or pollution, should be commensurate with the value of the resource over the long term. Fees could be collected by the resource management authority, and part of the fees used for sustainable management of the resource.

Responsible fishing operations

27. Harvesting practices involve selective allocation of fishing effort in space, time and among species and age groups using various gears in different areas and seasons. These must be compatible with minimum reproductive requirements of the target and non-target species, avoiding wastage and reducing capture of non-target, protected or endangered species. Specific controls and guidelines for fishermen need to be introduced with a strong educational component. Critical areas must be protected. Straits should be considered as "critical areas" for migrating fish and their access by fishing strictly regulated. When fishing on spawning concentrations, adequate escapement rates must be ensured to guarantee stock reproduction. In addition, the discharge of plastics and other entangling debris into the marine environment should be further prevented. More details are given in document FI/HSF/TC/92/4).

Environmental issues

28. Incidental catches of non-target species represent the main environmental impact of fishing in the high seas. The incidental catches of marine mammals, turtles and birds need to be reduced, and in the case of endangered species should, as far as possible, be eliminated. Even when carried out with improved gear in a responsible fashion, fishing will inevitably capture non-target species. Application of unduly restrictive norms may bring many forms of commercial fishing, whether large-scale or artisanal, to an end. The hardship thus caused to human coastal populations, particularly in developing countries, and the potential resultant loss of invaluable protein resources, will have to be taken into account. Simultaneously, critical coastal areas where marine turtles and mammals have breeding and nursery grounds should be protected or rehabilitated as fishermen should not be the only user group bearing the burden of conservation.

29. The harvesting of marine mammals for food or for predator control within EEZs should take into account the slow rate of replenishment of these populations, and should where necessary follow "merciful killing"

procedures. The importance of marine mammals from a cultural perspective will need to be recognized since related social concerns (which should be assimilated to non-fishery uses) can affect harvesting of associated resources.

30. "Ghost fishing" by lost or discarded gear has raised concern, given that synthetic netting materials may continue to "fish", particularly below the photic zone. To prevent illicit disposal of damaged nets, methods of gear marking are being developed which enables their origin to be traced (cf. FI/HSF/TC/92/4).

31. Partial or non removal of oil rigs on high seas shelves may constitute an environment problem for fisheries, impeding the proper and safe deployment of fishing gear (cf. FI/HSF/TC/92/4).

32. Acceptable levels of impact should be agreed in order to reduce transaction costs related to lengthy political negotiation. These could be related to the management criteria referred to above (MSY, MEY, MRB, etc.). In the case of fragile resources such as small cetaceans, turtles and sharks these levels would have to be established with extreme care. Determining such levels objectively, not only for single species but for the entire ecosystem, will not be an easy task.

33. Acceptable impacts must be reversible. Changes in relative species abundance are reversible as long as the species capacity to reproduce is not endangered and the integrity of the environment is not compromised. The time needed for species recovery may extend from 2-3 years for short-lived species in the tropics to several decades for long-lived species in colder areas, and depends on maintaining a favourable habitat and climate. It ideally requires integration of species management measures at the ecosystem level.

Best scientific evidence and uncertainty

34. The requirement for scientific evidence on which to base conservation measures on the high seas is included in Article 119 of UNCLOS which stipulates that States "shall take measures which are designed on the best scientific evidence available". The formulation in relative terms was designed so as to avoid that fisheries continue unregulated with the pretext of incomplete information. One practical effect is that scientific information has become of strategic importance, with very significant potential economic implications leading to the development of international scientific fora and of agreed methodologies and databases. Another has unfortunately been to increase the value of the data and the incentive to retain and distort them.

35. Decision-making with uncertain information and the risks involved are crucial problems facing managers today. Uncertainty is already important when considering the resources only. It is not negligible even with simple monospecific analytical approaches and increases with multispecific ones, culminating in ecosystem management. When, in addition, socio-economic, technological and operational dimensions are taken into account, the uncertainty increases even further, and scientific and management theory are progressively lagging behind management needs. If the range of uncertainty of a scientific advice is wide, so may be the range of statistically equivalent management options. As these options may have drastically different socio-economic and political implications, interest groups with different objectives may select, within the range, the most favourable one, eventually leading to "polarization" into extreme and unreconcilable positions.

Precautionary approaches and the burden of proof

36. Precautionary principles are a consequence of uncertainty and have been developed in relation to pollution prevention. They require States to take corrective action even in the absence of sufficient scientific evidence of a causal link between a suspected factor and the adverse effects observed or even before any effect is observed at all.

37. Regarding fisheries, these principles are not yet formalized but would require that the development of any new fisheries, or expansion of existing fisheries, should only be authorized after an environmental impact assessment (EIA) covering potential effect on target and non-target species. These principles would change fundamentally the relationship between science and decision-making in fisheries, reverting the "burden of proof" on industry and not allowing policy-makers to argue on real or pretended uncertainties in order to avoid difficult decisions. They would be essential to anticipatory management.

38. Their practical application, however, raises serious socio-economic concerns and technical difficulties, particularly in complex marine ecosystems. Considering the limited knowledge available on the biology and dynamics of such ecosystems, it would be difficult in most cases to forecast the long-term impact on the ecosystem with sufficient accuracy and credibility unless pilot projects are implemented. In the absence of agreement on acceptable levels of uncertainty and impacts, on which the principle does not provide any guidance, it would be of little practical value and unlikely to gain general acceptance.

39. Precautionary fisheries management has long been advocated even though it has rarely been applied in practice. Early (preventive) management measures have been recommended in order to avoid crises and higher costs in the future. This included such principles as: (a) step-wise development with monitoring of impacts as opposed to massive development; (b) a priori effort limitations instead of laissez-faire investment strategies; (c) design of institutional or financial "expansion brakes" to avoid "explosive" development; (d) request for prior authorization before ordering construction of new vessels; (e) precautionary quotas for species without proper assessment; (f) recommendations for multispecies management; (g) recommendations for "experimental management" to test systems response; (h) recommendations of development targets below the MSY; (i) adoption of the concept of "safe biological limits"; (j) modelling systems response across the whole uncertainty range; (k) prior agreement on cautious management thresholds (e.g., minimum spawning biomass) at which management action is taken automatically to avoid dangerous lags in decision-making.

Acceptable levels of impacts

40. Agreement on "acceptable" levels of impacts will be essential to fisheries sustainability. It must be accepted, for the sake of development and food security, that resources can be reduced by fishing to an agreed average level at which the resources existence (reproductive capacity) is not threatened. Reversibility of such impacts within an acceptable time-frame must be guaranteed and there is some trade-off between the intensity of fishing and the degree of resources conservation. It may, however, be difficult to forecast accurately the potential damage to the pristine populations resulting from planned development. Negotiations on acceptable levels of impact will require concerted research effort to lay down their objective basis and precautionary interim measures may be needed in some cases. They will require involvement of both fishery and non-fishery users to take into account all kinds of costs and benefits through fora or mechanisms through which both types of users can interact.

Resources allocation

41. Allocation of user rights and responsibilities is shown by experience to be required for efficient management of natural renewable resources even though this is not sufficient, in itself, to ensure sustainability. Such user rights can only be defined and controlled within an adequate institutional framework. The new Law of the Sea has gone a long way towards allocating rights and responsibilities in EEZs but the present state of high seas resources shows that they still have to be dealt with efficiently. The particular problem of straddling stocks has often been discussed and is still a subject of debate and conflict.

Institutions

42. Institutional deficiencies are partly responsible for the inadequacy of high seas resources management. These deficiencies relate to incomplete geographical coverage of regional fisheries bodies, insufficient cooperation between them, inadequate terms of reference for management and enforcement. (This issue is dealt with in more detail in document FI/HSF/TC/92/6).

Creeping jurisdiction

43. Most high seas resources originate in EEZs or enter EEZs during their life cycle for breeding, feeding and nursery areas. Straddling stocks, extending beyond national jurisdiction, into the high seas open-access system need urgent international management in a number of areas of the world. This situation leads to attempts from coastal States to gain "creeping jurisdiction" beyond that recently granted under UNCLOS. This was apparent, for instance, in the UNCED process, where countries have proposed (a) to give more recognition to the special interest of the coastal countries in straddling or highly migratory stocks, and (b) the need to take these interests into account when managing the straddling stocks.

Non-fishery users and public opinion

44. Non-fishery users (a broad category including other industrial sectors affecting the marine living resources as well as the public and the environmental institutions) and the need to take their views into account have, in some instances, led to broadening of the scope of management of marine living resources and it is obvious that appropriate "weighting factors" are required in order to meet the equity criteria while satisfying both development and environmental requirements.

45. Public opinion has had decisive influence on management of whales and seals and in some countries a special status is being advocated for almost all cetaceans. In both instances, as in the more recent driftnet fishing case, few developed countries were implicated and economic interests were modest. Public opinion intervened also recently in the tuna-dolphin issue in the Eastern Central Pacific and in the shrimp-turtle issue in the Gulf of Mexico. In these cases, developing countries were involved and the socio-economic consequences for all the actors were very significant. Decisions under strong public opinion may not comply with the UNCLOS requirement for "best scientific evidence".

The global climate change

46. Global warming, sea-level rise and increased ultra-violet radiation through the ozone hole will certainly affect fisheries. The changes may not be drastic but will affect the extent and conditions of nursery, feeding and breeding grounds, and the potential impact on high seas resources is unknown. At this stage, the volume of information is too limited to be integrated effectively in high seas management.

SUGGESTED ACTION BY THE TECHNICAL CONSULTATION

47. The Consultation is invited to consider the management issues, to comment on them, and to identify additional ones of relevance to high seas fisheries.

INTERNATIONAL FISHERY BODIES: CONSIDERATIONS FOR HIGH SEAS MANAGEMENT

INTRODUCTION

1. International cooperation is required for high seas fisheries management (Article 118 of the UN Convention on the Law of the Sea (UNCLOS)). Consensus on this point was reached during the deliberations leading to the conclusion of the Convention. All States have qualified rights to fish on the high seas but, in doing so, they should take conservation measures.[1] However, despite the recognized need to cooperate with respect to conservation and management, States did not reach agreement on the structure, type, powers and scope of mechanisms necessary to achieve effective high seas fisheries management. Recalling the principles embodied in UNCLOS, the requirement for international cooperation in high seas fisheries was subsequently reaffirmed in 1989 in United Nations General Assembly Resolution 44/225 with respect to driftnet fishing specifically, and high seas fishing, generally.

2. FAO and non-FAO fishery management bodies exist with conservation and management mandates for high seas areas. However, many of these bodies have not performed well in terms of attempting to rationally manage high seas resources.[2]

3. Regional fishery bodies perform with a variable degree of effectiveness (i.e., defined as the extent to which bodies are able to ensure that their management recommendations and decisions are implemented and adhered to by contracting parties).[3] Because of internal and external constraints some bodies have experienced difficulty in adjusting to changes brought by UNCLOS and the increasing complexity of fisheries management issues.

4. FAO's Strategy for Fisheries Management and Development recognizes the inherent political nature of fisheries management, particularly when allocations within a fishery are necessary as a basis for management. The Strategy also acknowledges that coastal States and distant-water fishing nations (DWFNs) have divergent interests, but that both groups should cooperate if fisheries resources, especially shared resources and high seas stocks are to be rationally utilized.[4] The challenge for existing and proposed fisheries management bodies is to achieve a balance between the interests of coastal States and DWFNs so that workable arrangements for management can be established. Indeed, the breakdown of some management bodies through the withdrawal of parties and/or their refusal to accept or to adhere to management recommendations can be traced or attributed to (i) a lack of compatibility between coastal State and DWFN interests with respect to

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[1] Qualified in the sense that the right to fish is subject to the conditions laid down in Article 116.

[2] Fishery body is broadly defined to mean fishery commission, committee, organization, agency or council. It may be constituted to have competence over a geographic area (a region or a larger area) or designated specie(s).

[3] Contracting parties or non-contracting parties in this paper imply members or non-members of fishery bodies, depending on their respective legal status.

[4] Coastal States may claim a superior interest in such resources. Moreover, where coastal States are involved in stock enhancement (e.g., salmon) and maybe foregoing land-based development in order to secure such enhancement (e.g., construction and other activities along rivers), it is likely that these States will claim more than a superior interest in the enhanced stocks so as to compensate for the development opportunities foregone.

resource allocation, and (ii) failure of contracting parties to enforce management decisions reached.

EXISTING ORGANIZATIONS

5. In attempting to manage resources, fishery bodies have, to some extent, functions related to data collection and analysis, research, the formulation of management recommendations, training, development and monitoring, control and surveillance (MCS). In addition, some post-UNCLOS bodies have emphasized management through regional cooperation and harmonization of activities, as envisaged in UNCLOS and reaffirmed in FAO's Strategy for Fisheries Management and Development.

6. Attachment 1 contains a list of existing and proposed fishery bodies concerned with the conservation and management of living resources of the high seas, in an FAO/non-FAO matrix by area of competence, species, membership and, where appropriate, remarks concerning the status of bodies. In addition, information concerning the FAO statistical areas covered by these bodies is shown.

7. An assessment of the effectiveness of fishery bodies shows a high degree of variability in performance, with a number of them being handicapped in the execution of their mandated functions. Although some bodies are inactive or virtually dormant, others have been engaged in fisheries management in search of innovative international arrangements. Nonetheless, it should be recognized that some bodies have exerted little beneficial impact on resource use and have attempted to remedy situations only after stock decline was well advanced.

8. While it is difficult to specify universal characteristics that make one fishery body more effective than another, bodies are likely to perform most effectively when contracting parties (i) have congruent fisheries interests, (ii) have a strong economic interest in fisheries, (iii) have a sharp, coherent and consistent management focus, and (iv) have a capacity and political will to implement recommendations and decisions.

9. Analysis of fishery bodies' operations shows that they are constrained by a number of factors, including:

(i) a lack of funds and properly constituted and staffed secretariats. Funding difficulties are critical for many bodies and some have had to drastically curtail inter-sessional activities because of financial constraints, principally due to the non-availability of funds from extra-budgetary sources. Some FAO bodies are also attempting to function without properly constituted and staffed secretariats which inhibits the preparation and execution of work programmes.

(ii) disagreement over scientific advice concerning management and a refusal of contracting parties to accept such advice as binding. The provision of scientific advice is essential for fisheries management. However, there has been a trend for contracting parties to disagree with, and therefore reject, results of data analysis, resource assessment and the management prescriptions flowing from such advice. This situation has created confusion and a near breakdown of management functions in some bodies. It has also inhibited effort control and proper resource allocation to prevent over-exploitation.

(iii) conflict of interest among contracting parties and an inability to agree fully on the parameters necessary for management. It is important to recognize that not all contracting parties in a body have congruent management interests.

(iv) unregulated fishing by non-contracting parties undermines efforts to promote rational resource use by fishery bodies. A country or an entity may opt not to participate in such bodies or may be prevented from doing so for political or other reasons. The impact of fishing by non-contracting parties on management efforts in a fishery can be severe, and in the extreme, is capable of negating attempts to secure sustainable resource use.

(v) inability to make binding recommendations and decisions concerning management. Many fishery bodies are empowered to make recommendations only concerning management and are not in a position to ensure that contracting parties implement and abide by such recommendations. Under these circumstances management efforts are weak and are not conducive to effective resource use since contracting parties have the option of not implementing measures, particularly if their fleets are disadvantaged by such decisions.

(vi) no fishery body has the legal or actual capacity to enforce management recommendations and decisions. Moreover, bodies do not have the competence to impose sanctions for non-compliance with decisions by contracting parties and this weakens their management capacity.

(vii) veto of recommendations and decisions by a contracting party, a requirement to take unanimous decisions, the use of simple majority voting procedures or the use of consensus decision-making weaken the impact of management recommendations and decisions adopted by fishery bodies.

10. To realistically address constraints facing fishery bodies and to equip them to deal more effectively with high seas issues, some of them would need to enact fundamental changes concerning their objectives, structure, purpose and powers. However, such restructuring may have little effect if high seas management is not accorded a high priority by contracting parties.[1]

11. Increasing international concern for sustainable use of high seas fisheries resources has shown the need for fishery bodies to be effective in promoting rational resource use. This concern points to the need for new, more sophisticated, comprehensive and binding approaches to management than has been the case in the past. Fishery bodies, in formulating and implementing measures designed to meet the demands of the international community, may need to address such concepts as responsible fishing, precautionary approaches to exploitation and new scenarios concerning the burden of proof. These issues have been addressed and elaborated in a number of international fora, including FAO consultations and meetings and the Preparatory Committee for the United Nations Conference on Environment and Development (UNCED). A conclusion drawn from these and other issues by many countries is that it is no longer internationally acceptable for fleets to fish on the high seas and to claim that no action regarding their operations should be taken until scientific evidence demonstrates a need for concern, particularly when such fleets contribute no data for research. Therefore, in future, fishery bodies may need to be assigned increased management responsibilities because of these new international concerns and, in turn, be held accountable to an international high seas management authority for their action or otherwise with respect to management.[2]

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[1] Inshore fisheries issues continue to preoccupy national fisheries administrations in many developing countries. Indeed, for economic reasons most developing continental coastal States have not attached the same level of importance to offshore and high seas fisheries issues that developing island countries have done. However, they may be pressured to do so in future by non-fishery users.

[2] Not addressed in this paper are important issues concerning accountability, including to whom bodies should account, the mechanism by which they would account, penalties that might be imposed, appeal provisions, etc.

COOPERATION AMONG MANAGEMENT BODIES

12. As a matter of principle, cooperation among fishery bodies should be encouraged. Informal relations between many fishery bodies already exist, and scientists and fisheries managers from one body consult regularly with colleagues in other bodies on matters pertaining to management. In some cases representatives of bodies observe the proceedings of other bodies. There is merit in enhancing arrangements for collaboration between fishery bodies, both at the intra- and inter-regional levels and especially where bodies focus on the management of the same species in different parts of the world.

13. Recognizing the importance of inter-regional cooperation, some non-FAO fishery bodies having similar management and management-related functions and problems (e.g., South Pacific Forum Fisheries Agency, South Pacific Commission, South Pacific Permanent Commission and Latin American Organization for the Development of Fisheries) have initiated steps to collaborate and exchange information on a broad range of technical and management issues.

14. FAO has recognised the importance of such cooperation and has established close collaborative links with virtually all regional fishery bodies, especially those in the developing world. FAO has also devoted special consideration to cooperation with regional tuna bodies and has played a pivotal role in establishing new ones.

15. In 1966 at its first session the Committee on Fisheries (COFI) established the Sub-committee on the Development of Co-operation with International Organisations Concerned with Fisheries (Resolution No. COFI/1/1). The purpose of the Sub-committee was to assist COFI deal more effectively with complex problems resulting from the large number and variety of existing international bodies concerned with fisheries, to improve coordination among the bodies, to make the best use of bodies for the benefit of member countries and to foster fisheries development. The Sub-committee met regularly until 1978.

16. Given that coordination among FAO and non-FAO fishery bodies should be strengthened, it might be opportune for COFI to consider the reactivation of the Sub-committee on Development of Co-operation with International Organisations Concerned with Fisheries, or an equivalent mechanism in order to provide a forum for regional fisheries bodies to meet to address issues of common concern and to coordinate activities. Such meetings could be convened immediately prior to regular COFI sessions to facilitate information exchange between fishery bodies and to consider avenues for cooperative undertakings. At the present time the lack of such a mechanism is inhibiting closer cooperation among regional fishery bodies.[1]

CONDITIONS FOR MANAGEMENT BODIES TO BE EFFECTIVE

17. To be effective vehicles for high seas management, fishery bodies need to have a significant degree of independence in the execution of their functions, be assigned powers consistent with their management tasks and receive support from contracting parties. While the following list of issues is not exhaustive in terms of matters that should be addressed to encourage efficiency in management, it covers issues that would, as a minimum, need to be considered.

Purpose

18. The purpose of fishery bodies should be clearly understood and agreed by contracting parties. This is essential to ensure that common and achievable objectives are established and that management is defined comprehensively, addressing biological and economic considerations.

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[1] Initially, consultative arrangements might focus on regional tuna bodies and be progressively extended to other fishery bodies.

Moreover, bodies should draw, as and where appropriate, on UNCLOS provisions, and on guidelines that might be developed for high seas fisheries management.

Membership

19. Current international law and practice normally precludes the application of the exclusion principle in high seas fisheries. This means that all States have a qualified right to exploit these fisheries.[1] It is therefore likely that high seas management mechanisms will have, as contracting parties, both developing and developed coastal States and DWFNs. While some States may favour the determination of eligibility criteria for participation in such mechanisms, this approach might not be internationally acceptable, particularly since it could disadvantage developing countries. However, as a condition for participation, contracting parties are likely to be required to have the competence to (i) implement and abide by management decisions, and (ii) initiate measures to ensure that flag vessels comply with such decisions.

Species coverage

20. High seas fishery bodies may cover individual species, groups of species, or all species within an area, including target and by-catch species. It is possible that there could be controversy concerning the species to be covered by a fishery body. However, such controversy might be minimised by avoiding overlap of management responsibility for the same species in the same region.[2]

Management area

21. To be effective, it is necessary for a body's competence to cover the entire range of stock or stocks under management. This means that the competence should extend to resources occurring both within EEZs and on the high seas. There appears to be little disagreement on this point so long as the stock range, based on the best scientific evidence available, has been determined.

Catch data and related information

22. A primary ingredient for the formulation of sound scientific advice for fisheries management is accurate and complete data supplied by contracting parties in a timely manner. The acquisition of such data requires that vessels of contracting flag States maintain daily catch logs. Moreover, for maximum effectiveness the flag State should take steps domestically, and accept responsibility for the completeness and accuracy of data submitted to the management body. This point is considered below in the section relating to flag State responsibility.

23. Data necessary for management will vary from one fishery to another but, as a minimum, contracting parties should furnish information relating to total catch of both target and non-target species, catch per unit of effort, species composition, discards and location of catches in the management area. Since many management decisions need to be taken promptly, data that are not provided on a timely basis may be of little real value for management, except perhaps for historical analyses. The need for data to be supplied in a 'real time' context is therefore paramount.

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[1] It should be noted that membership of a fishery body and the right to exploit a resource are not necessarily linked.

[2] In cases where overlap does occur (e.g., tuna in the Mediterranean falling under the responsibility of ICATT and GFCM), arrangements between the respective fishery bodies should be carefully worked out.

Scientific advice

24. Sound, comprehensive and unbiased scientific advice is a pre-requisite for fisheries management. There is little disagreement on this point. However, the quality of management advice will be affected by the (i) completeness, accuracy and timeliness of data supplied by contracting parties, and (ii) willingness of scientists to interpret data and to formulate recommendations on information that, for various reasons, might be incomplete.

25. In adopting such a cautious approach to the provision of scientific advice needed for management, scientists may simply confirm a problem after it is entrenched. Since confirmatory advice is of little benefit to fisheries managers, scientists should be encouraged to be more willing to provide pre-emptive advice and assessment, even if initially it is provided on a provisional basis within relatively wide confidence levels. Such a change in approach is warranted, given the importance the international community attaches to consideration of precautionary approaches and sustainable resource use as integral components of high seas fisheries management.

26. In formulating advice for high seas fisheries, it is advisable that measures proposed for implementation be predicated on the application of a level of fishing effort that will enable resource rent to be generated. This point is considered below in the section relating to finance. Since financial constraints are a major concern for fishery bodies, it should be recognized that high seas fisheries are capable of generating rent and that some part of this rent, if appropriated, can be used to finance management activities.[1]

27. Within a management mechanism, a scientific advisory group (SAG) would normally be constituted. Many fishery bodies have such a group. SAG's role would be to provide advice and guidance for management. However, the cost of research necessary for the development of management advice is high, and the funding of such research would need to be addressed within the financial framework of a management body.[2]

Management body

28. To maintain the confidence of contracting parties, fishery bodies must act neutrally and impartially (i.e., not favouring any particular interest groups within bodies) in determining management measures. Failure to act in such a manner will undermine the effectiveness of management, rendering bodies liable to charges that measures are biased.

29. Whereas the purpose of a management body might not be controversial, some of its functions, powers and responsibilities are liable to attract considerable debate. For high seas fisheries, the secretariats of management mechanisms might, at the direction of contracting parties, *inter alia*, receive data, undertake analyses, determine effort levels and control effort and capacity, maintain a register of vessels and infringements, propose resource allocations by flag State (on the basis of pre-determined criteria). Secretariats should also service meetings, prepare costed work programmes and receive revenue for the support of activities.

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[1] Rent is the difference between total revenue and total cost of operating in a fishery where total cost includes normal returns to capital and labour.

[2] It may not be necessary for a body to have a dedicated research arm since this requirement could be met by national institutions of the contracting parties. Under these circumstances, SAG would have a coordinating role to play and be responsible for receiving and assessing information from these institutions in the course of developing management advice.

30. To enhance the efficiency of fishery bodies, they should be made accountable for their actions to an international management authority. However, if accountability is to be introduced or increased, bodies should be assigned additional responsibilities and powers in order to achieve a balance. Consistent with this situation would be the possibility of bodies having powers to exclude vessels from the management area and impose penalties. While it is not envisaged that bodies would be required to invoke these powers if flag State responsibility is effective, there may be instances where this is not the case and a safeguard should be vested in the management body to ensure that the interests of contracting parties are not jeopardized.

31. Few, if any, fishery bodies, by virtue of their constitutions, are accountable for their actions. This situation is not conducive to strong and effective management. The international community is now requiring that fisheries be conducted responsibly and in a precautionary manner. Implicit in the adoption of these approaches is the requirement that States and fishery bodies be held accountable for their fishing and management activities.

32. A critical function of the fishery body, as envisaged in Article 119 of the UNCLOS, would be to determine effort levels for the management area. Consistent with current practice, this determination should be made utilizing the best scientific advice available. However, once recommended by the body, negotiation of effort levels (which is normally based on commercial and non-scientific considerations) should not be entertained. Moreover, for maximum effect, the body's recommendations should be adopted without reservation by the contracting parties. This approach is essential to ensuring that high seas resources are managed sustainably and that uncompromised scientific advice forms the cornerstone of management decisions.

33. Where resources straddle EEZs and high seas areas, a division between coastal States and the high seas areas based on negotiated principles will be required before allocations are made to contracting parties operating on the high seas. Consistent with the non-derogation of sovereignty principle, coastal States will be able to determine independently, in accordance with domestic laws and policies, how their shares of the resource will be harvested. However, coastal States with respect to the exploitation of their EEZs resources and DWFNs with respect to high seas operations, would be obliged to act consistently with the general provisions of the management arrangements in place. While the division of resources between coastal States and the high seas will be contentious, the need for coastal States to act consistently with a management regime of which they are part is likely to be readily accepted as a requirement for effective management.

34. Having established high-seas effort levels based on objective scientific parameters, allocation among contracting parties is required. This task is a highly sensitive and political undertaking which, despite the possible existence of guidelines or criteria for allocating shares, will be subject to intense negotiation.

35. Provisions for transfer of high seas shares allocated to a contracting party might be considered by the fishery body. Wastage through the non-harvest of allocations should be avoided and the management body would need to address this issue. A variety of approaches could be considered, including the reallocation of shares to other contracting parties by the managing body. In any event, for management reasons, the body would need to monitor closely transfers between parties.

36. As part of the management process, parties should agree on measures to be adopted to facilitate the accommodation of new entrants to a fishery. This is particularly important for developing countries that might not have the current capacity to engage in high seas fishing but which could acquire the capacity at some future time. This point is considered below in the section relating to new entrants.

Flag State responsibility

37. Flag State responsibility is not a new concept, being provided for in numerous Articles of the UNCLOS. Furthermore, FAO's Strategy for Fisheries Management and Development proposes the use of the concept, urging coastal States to apply it.

38. Consistent with this Strategy, many coastal States require flag States to accept responsibility for their vessels under bilateral and multilateral licensing arrangements.[1] Under such arrangements, flag States agree to undertake designated activities and functions, inter alia, the supply of true, complete, accurate and verifiable data, an undertaking that vessels will comply with terms and conditions of licence in the management area and, in the event of non-compliance, to institute action against violators in their national jurisdictions. It would also be the responsibility of the flag State to ensure that, for MCS purposes, vessels be identified in accordance with the FAO standard specifications for the marking of fishing vessels.

39. During sessions III and IV of the Preparatory Committees of UNCED, the proposal to increase flag State responsibility for high seas fisheries received support since it was recognized that such responsibility would be a necessary and cost-effective means of securing compliance with high seas management measures. In the absence of flag State responsibility, and with vessels flying flags of convenience, it is anticipated that any high seas management mechanisms will be weak and variable in application. In this connection it should be recognized that flag State responsibility does not disadvantage high seas operators that abide by management measures. In fact, it serves to reinforce such measures for the material benefit of all licensed fishermen. When States permit the use of flags of convenience and vessels flying these flags undermine high seas management efforts, internationally-agreed measures are likely to be required to penalize such States.

Finance

40. Most fishery bodies face severe financial constraints. Innovative ways must therefore be found to finance activities associated with high seas management.

41. Like other fisheries, high seas fisheries are capable of yielding resource rent if rationally managed (i.e., if overcapitalization is prevented). It could be envisaged that rent appropriated from high seas fishing could be used for management.[2] Principles and methods that might be applied to the extraction of rent within nationally managed fisheries are similar to principles that might be used to extract rent from high seas fisheries.

42. If it is necessary for a contracting party, as part of flag State responsibility, to institute proceedings against vessels for violations, net revenues derived from fines (i.e., fines minus reasonable costs incurred by the contracting party in collecting the fines) should be contributed to the management body. This is appropriate since the violation, in effect, was committed against the other contracting parties. In addition, to ensure that parties maintain confidence in investigations undertaken within their respective jurisdictions as part of their flag State obligations, copies of

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[1] This concept has been extended, under Treaty in at least one case, to cover the activities of fleets operating both within EEZs and on high seas areas.

[2] Economic theory of the fishery and management practice demonstrate that, if economic principles figure substantively in management decisions and if overcapitalization is avoided through effort limitation, not only will fishermen enjoy enhanced prosperity but this action will, in the absence of significant fishing by non-contracting parties, facilitate sustainable resource use.

documentation concerning violations should be made available to the management body and could, in turn, be distributed to the other parties for information. Such distribution of documentation will facilitate rigorous and timely investigation of alleged violations.

Management decisions

43. Fishery bodies should take decisions based on direction provided by contracting parties. However, bodies may be handicapped in their efforts to implement sound and binding management decisions because of prescribed arrangements for the adoption of decisions. Where decisions are taken by simple majority voting or require unanimous agreement among the parties, management measures will normally be weak and ineffective. This is because management decisions can be taken with as little as 51 percent agreement among the parties or because one party can veto decisions.

44. To facilitate the adoption of firm management decisions, it is necessary, as a precondition, that all contracting parties unanimously accept the regime's provisions. However, in the interests of obtaining firm and sustainable decisions concerning management, qualified majority voting should be employed.

Non-contracting parties

45. The treatment of non-contracting parties is an important and real issue that should be addressed in the context of high-seas fisheries management. Some nations or other entities operating in a fishery may opt not to participate in a high seas management body or they may be excluded from it (e.g., for political or other reasons). The effectiveness of high seas management will therefore be significantly reduced if a major entity in a fishery does not participate in determining management decisions and in turn is not bound by those decisions.

46. The exclusion of parties from management bodies for political or other reasons poses particular difficulties. Taiwan (Province of China) is a major international fishing entity. Its high seas fishing capacity is extensive and likely to increase, especially in the Indian and South Pacific Oceans. However, due to political non-recognition, Taiwan (Province of China) does not participate fully in any fishery management bodies. Similarly, legal constraints prevent the EEC from participating in some fishery bodies.

47. The non-contracting parties problem must be addressed. This is because, despite efforts to manage high seas fisheries, attempts to achieve sustainable use may be thwarted by unregulated fishing by non-contracting parties. Such unregulated activity will erode benefits accruing from measures designed to promote rational exploitation.

New entrants

48. Given that the nationals of all States have a qualified right to fish on the high seas, procedures must be found to accommodate new entrants to high seas fisheries while ensuring stabilization of extraction rates (i.e., the shares going to existing participants in a fishery will need to be reduced or transferred through some other type of arrangement supervised by management bodies). Resource conservation reasons cannot be used to justify the exclusion of new entrants. Moreover, the special requirements of developing coastal States should be taken into account (Article 119 of UNCLOS).

49. The issue to be addressed concerning new entrants, especially in fisheries that are already fully exploited, is to determine how resource reallocations are to be made. An equitable and acceptable mechanism for this purpose should be found if management is to be effective.

50. Related to the question of new entrants is the possibility of vessels reflagging in order to circumvent measures that might be agreed by contracting parties concerning quota allocations. Measures to deal with the reflagging

issue will need to be addressed in detail, including the adoption of international guidelines.

Monitoring, control and surveillance

51. Like the management of fisheries under national jurisdictions that must be submitted to MCS, it is also necessary that high seas fisheries be subject to a similar type of scrutiny if management arrangements are put in place. However, it is not envisaged that fishery bodies responsible for high seas management would have an MCS capacity in the conventional sense since this would not be realistic in terms of logistics and cost. Alternative, more cost-effective measures therefore need to be adopted.

52. Several approaches to high seas MCS might be considered. As part of flag State responsibility, States should undertake to legally enforce management arrangements. In addition, flag States might deny vessels access to a fishery, either temporarily or permanently, if they have seriously violated management arrangements or if they have been repeated offenders. The threat of exclusion represents a powerful tool to elicit voluntary compliance.

53. For management, all vessels licensed to operate in a high seas fishery should be fitted with transponders that could be used to monitor vessel and fleet movements. A precedent for the installation of these devices on vessels in high seas areas has been established. Provision for the placement of observers should also be encouraged, though the managing body would determine whether the use of observers was appropriate and necessary.

54. An additional means of eliciting compliance with high seas management measures would be to encourage other vessels operating in the fishery to report violations.

Dispute settlement

55. Provision for the settlement of disputes among contracting parties or between a contracting party and the management body is necessary. Acceptance of such provisions is unlikely to be a matter of significant controversy since most fishery bodies have clearly-defined dispute-settlement provisions. However, some contracting parties might find difficulty in accepting binding settlement provisions. Such provisions are necessary to enhance management. Alternative dispute settlement procedures such as mediation or negotiation might be considered, but these approaches are inferior to binding settlement.

Penalties

56. While the primary responsibility for the imposition of penalties for infringements of high seas management measures should lie with a contracting flag State, the management body might also be assigned rights of redress against violators. This is because the inability of fishery bodies to impose penalties has been identified as a weakness in achieving effective fisheries management. To carry out such an undertaking effectively, management bodies, or an international high seas management authority, should maintain a register of vessels and gear. If flag State responsibility is applied without prejudice by all contracting parties, the need for a management body to be actively involved in the investigation of infringements and in the determination and imposition of penalties should be minimal. However, for maximum effectiveness, a timetable for the investigation of alleged violations, guidelines for the imposition of penalties and remittance of fines to the management body might be agreed by the contracting parties.

57. To prevent dispute among contracting parties or between a party and the management body with respect to the imposition of penalties, parties need to agree in advance on the parameters surrounding the imposition of penalties by a body. Moreover, clear provisions involving the consultative process that a management body would need to follow in the event of a violation should be specified.

CONCLUSIONS

58. Mechanisms for enhancing the management of high seas fisheries need to be found. This is because unregulated, open-access fishing is not only economically wasteful but it is increasingly becoming less acceptable to the international community because it does not lead to sustainable resource use.

59. The situation for coastal States that have important fisheries resources falling both within their national jurisdictions and in high seas areas, and for highly migratory species, is especially critical for management. The lack of a high seas management mechanism for some of these resources has led coastal States to make unilateral declarations concerning management that impinges on high seas areas. This has been done principally, in their view, to conserve fisheries under their jurisdictions and to protect domestic economic interests. While coastal States, for economic and political reasons, may need to make such declarations, it is possible that a chaotic situation could evolve regarding the use of high seas resources in the absence of international cooperation and agreement concerning their orderly exploitation.

60. Whatever mechanism is agreed for high seas fisheries management, it is essential that the mechanism be acceptable to both coastal States and DWFNs and that it be seen to be equitable. This is a primary consideration to ensure that there is a high degree of voluntary compliance with management arrangements by all parties participating in the fishery. Fundamental changes to the powers and statutes of existing fishery bodies will need to be enacted to increase their accountability, facilitate stronger flag State responsibility and MCS provisions, improve collection of data and other information necessary for enhanced research, ensure fishing effort is controlled in line with negotiated resource allocations and that voting procedures within management bodies are adequate to support effective high seas management.

SUGGESTED ACTION BY THE TECHNICAL CONSULTATION

61. In reviewing this paper, the Consultation is invited to comment on the effectiveness of the international fishery bodies and the greater need for closer cooperation of their activities and to provide advice to make such bodies more effective.

PARTICIPATION OF DEVELOPING COUNTRIES IN HIGH SEAS FISHING

INTRODUCTION

1. The adoption of the UN Convention on the Law of the Sea (UNCLOS) in 1982 and the extension of national jurisdiction to cover the 200 miles exclusive economic zones (EEZs) by coastal States created new opportunities and challenges for the development and management of world fisheries. With the replacement of the traditional concept of open access fisheries by national control over waters within which most of the world's fish stocks were to be found, it was expected that coastal States, both developed and developing, would embark upon programmes to effectively conserve and manage their fish stocks and provide new management mechanisms for those stocks occurring in waters between adjacent coastal States. FAO anticipated at an early stage the challenge presented by the new regime of the oceans and established a comprehensive programme of assistance to developing countries for the promotion and management of fisheries in their EEZs.

2. The increased capacity of distant-water fleets to harvest resources of the high seas and the likely impact of such activities on the management and sustainable use of fisheries within EEZs are posing new challenges to developing coastal countries. At present, only few developing countries in Asia and Latin America are involved in fishing operations on the high seas, but other countries may commence such fisheries in the future. In Asia, the participation of developing countries in high seas fishing has been dominated by the Republic of Korea and China including Taiwan (Province of China). However, other countries may have the potential to join in the future. Similarly in Latin America, Ecuador, Mexico and Venezuela are currently involved in high seas fishing ventures but total catches are lower than those of the Asian countries whose fleets use a wide variety of gears, such as longlines, purse seines, trawls and until recently, large-scale driftnets.

3. Freedom of fishing on the high seas for all States is recognized under Article 87 of UNCLOS. This freedom is available to the nationals of all States, whether coastal or land-locked, and it implies a right to have the opportunity to share in this common resources of mankind. This consideration is also reflected in Article 119(a) of the Convention which underlines the special requirements of developing States.

4. Furthermore, the participation of developing countries in high seas fishing could be seen against the policy objectives of securing greater food supplies and food security for the people in these countries and of earning valuable foreign exchange if high value species such as tuna are harvested and exported. In the past such objectives encouraged some centrally planned European countries to foster high seas fishing. However, in both centrally planned economies and some developed countries, the promotion and maintenance of high seas fishing depended, and continues to depend, to a significant extent on the payment of government subsidies. Since subsidies distort the economic viability of commercial undertakings, often leading to investment in ventures that are not economically feasible, the use of subsidies to facilitate or maintain high seas fishing fleets should be discouraged.

CONSTRAINTS

5. The following characteristics of high seas fisheries constitute some of the major constraints that developing countries will have to overcome in order to acquire high seas fishing capabilities:

(i) Technology: Most high seas fisheries resources are dispersed and difficult to harvest. They are therefore mostly exploited by long-range fleets equipped with modern high-level fishing technology capable of locating resource concentrations, identification of schools and economic methods of harvesting fish under scarce and dispersed conditions.

(ii) **Cost factors**: The capital and operational costs for procurement of large-scale vessels with high-tech equipment for navigation in a wide geographical area are high when compared with investment requirements for fishing industries within EEZs.

(iii) Marketing: In order to compensate for the above factors, it is necessary to develop appropriate marketing policies for target species, whether for species (e.g., bluefin tuna or squid) that have high market value, or species that have larger and established markets, even if the unit price of raw material is not so high (e.g., skipjack or yellowfin tuna for canning). Since these tuna markets exist in developed countries (principally USA, Europe and Japan) it is necessary to develop the technical "know-how" in market forecasting, processing methods, quality assurance, etc., in order to have access to and meet the requirements of markets. For other species such as jack mackerel off Chile and Peru there exists only relatively low value markets, mainly in developing countries.

(iv) Competition: When the developing countries are able to start high seas fishing, they will be exposed to intense international price and quality competition from existing fleets as well as prevailing tariff and non-tariff barriers.

ACCESS

6. The establishment of high seas fishing capabilities is costly and requires significant investment in technology and human resources development. Such investments would be associated with significant risks if access to resources is not ensured at economic levels. Moreover, the right to fish on the high seas under the 1982 UNCLOS is not absolute. It is subject to the limitations set out in the Convention which provides not only specific obligations in relation to conservation and management of straddling stocks and highly migratory species but also obligations with respect to other States that are exercising their right to fish on the high seas. The provisions suggest that the nature of access to high seas living resources by new entrants would depend on the management regime established by the existing operators in the fisheries. This could limit the opportunities of developing countries to participate in such fisheries. However, Article 119.3 makes provision for non-discrimination against the fishermen of any State.

7. While accurate data on available high seas stocks are limited, it is believed that some resources are already heavily exploited. This situation creates difficulty for new entrants. Therefore access mechanisms need to be created, and internationally agreed, that take due account of the rights of present operators and the aspirations and needs of developing countries wanting to participate in the exploitation of high seas fisheries resources.

TECHNICAL AND FINANCIAL CONSIDERATIONS

8. Initially, developing countries that are most likely to participate in high seas fisheries are small island nations with a high economic dependency on fisheries and the ocean in general; coastal States with a high potential to exploit highly migratory and straddling fishery resources; and countries with a high demand for fish and fishery products due to large populations and fish eating traditions. In general, the developing of high seas fishing capabilities by developing countries could be on a step-by-step approach. It could start by the development of industrial fisheries within EEZs. If it is decided that further development is technically and economically feasible, the next step would be to expand the area of operation into the high seas.

9. If the countries have successfully accomplished industrial fisheries development within their EEZs, they should be ready to upgrade the industry for high seas fishing. A wide range of support might be required including research, education and training, technology transfer, and finance. Small island countries may find it advantageous to set up joint high seas operations due to high costs and the level of technology involved.

10. The following areas would require major technical and financial support:

(i) Education and training of high-level technicians such as captains and engineers who can manage international navigation and handling of high-tech equipment as well as specialists in fish processing and quality control;

(ii) Establishment of infrastructure facilities which can provide support for high seas fishing fleets.

(iii) Strengthening of capabilities for fisheries policy formulation, investment planning and resource management.

11. With respect to technical and financial considerations, the "Declaration of Cancún" adopted by the International Conference on Responsible Fishing held in Cancún, Mexico (6-8 May 1992) stressed that:

> "International cooperation in responsible fishing should also take the shape of greater financial support for investments by developing countries, channelled through existing international and regional financial organizations, association mechanisms and other forms of cooperation. The goals of that support should be to improve and broaden fishing activity, consistent with responsible fishing, ranging from capture and fish farming to processes incorporating added value to products destined for domestic consumption and international trade".

12. While in principle participation by developing countries in high seas fishing should follow competitive rules (assuming that resources are subject to management), it might be appropriate to consider whether these countries should, in future, be allocated a prescribed share of high seas resources in order to guarantee that they have the possibility of participating in such fisheries. Such an approach to high seas resource allocation would have to be concluded on a region by region and/or a stock by stock basis and be subject to international agreement.

SUGGESTED ACTION BY THE TECHNICAL CONSULTATION

13. The Consultation is invited to examine the special requirements of developing countries wanting to exploit high seas living resources and possible measures to secure an appropriate share of these resources for their benefit including technical assistance and sources of financial support to achieve such participation.

ANNEX 1

FAO MANDATE ON HIGH SEAS FISHERIES MEETINGS

(Extracted from FAO Fisheries Report No.459, Report of the 19th Session of the **COMMITTEE ON FISHERIES**, Rome, Italy, 8-12 April 1991):

"84. Most delegations stated that due consideration will have to be given to the research needs and to the legal, institutional and policy aspects of high seas fishing, for which FAO has also responsibility. Other delegations stated that the UN Office for Ocean Affairs and the Law of the Sea (OALOS) was the appropriate forum for legal and policy guidance on high seas fishing issues. It was agreed that FAO and OALOS should continue to cooperate in their efforts. Several delegations referred to the expert meeting on the Implementation of the Legal Regime for High Seas Fisheries under the UN Convention on the Law of the Sea to be organized in July 1991 by the UN Office for Ocean Affairs and the Law of the Sea (OALOS) in cooperation with FAO.

85. There was wide support to consider that, in view of the complex and delicate nature of all the above-mentioned issues it would be wise to submit them first to an expert consultation and then to an ad hoc intergovernmental consultation which would report to the Committee on Fisheries at its next Session. It was recommended that participation in both meetings be widely open so as to gather the maximum of expertise and advice and that the draft agenda of these meetings be prepared in consultation with member countries. However, some delegations did not support the idea of an expert consultation and of an ad hoc intergovernmental consultation proposed by FAO."

(Extracted from CL 99/REP. **REPORT OF THE COUNCIL OF FAO**, Ninety-ninth Session, Rome, 10-21 June 1991, para.111):

"111. The Council agreed that FAO had an important role to play in promoting international understanding about the responsible conduct of fishing operations. Technical work in this field could result in the elaboration of guidelines which would lead to a code of conduct on adequate fishing practices, thus contributing to the rational utilization and management of living resources, including those of the high seas. A majority of members supported the proposals that FAO in consultation with Member Nations on the agenda convene in the 1992-93 biennium an Expert Consultation, followed by an Intergovernmental Consultation, to review the various issues related to the rational management of these high seas resources. The Council also suggested that FAO continues to collaborate closely with the UN Office for Ocean Affairs and Law of the Sea (UNOALOS) and concerned international fisheries organizations, and consult with interested countries. It was emphasized that the activities concerning high-seas fisheries should not be at the expense of assistance to developing member countries in the development and management of living resources in their exclusive economic zones (EEZ)."

(Extracted from C91/REP. **REPORT OF THE CONFERENCE OF FAO**, Twenty-Sixth Session, Rome, 9-27 November 1991, para.239):

"239. Noting the complex and delicate nature of issues related to high seas fishing, the Conference endorsed the Council's recommendations to convene a Technical Consultation on High Seas Fishing in 1992, to be followed by an ad hoc government consultation."

ANNEX 2

DECLARATION OF CANCUN

INTERNATIONAL CONFERENCE ON RESPONSIBLE FISHING
Cancun, Mexico, May 6-8, 1992

CONSIDERING:

The importance of fish products as a source of nutrition for the peoples of the world;

The importance of preserving the marine environment;

That high seas fisheries have expanded over the last decade, that the management of high seas fisheries, including the adoption, monitoring and enforcement of effective conservation measures, is inadequate in many areas and that in some areas resources are overutilized, causing serious concerns for some States with regard to the impact on their fisheries;

The severe problems of excess fishing capacity in many of the world's fisheries;

The need to improve fishing practices and fisheries management to avoid overexploitation of fisheries resources or loss of biodiversity;

The vital need for fishing to continue and develop within a comprehensive and balanced system under the concept of "responsible fishing";

That this concept encompasses the sustainable utilization of fisheries resources in harmony with the environment; the use of capture and aquaculture practices which are not harmful to ecosystems, resources or their quality; the incorporation of added value to such products through transformation processes meeting the required sanitary standards; the conduct of commercial practices so as to provide consumers access to good quality products;

The existence of various measures, already adopted, to achieve a better relationship between fishing activities, the conservation of the environment and biodiversity, and the recommendations issued by the World Conference on Fisheries Management and Development, convened by the Food and Agriculture Organization of the United Nations (FAO) in 1984;

The relevance of the deliberations of this Conference to the United Nations Conference on Environment and Development (UNCED);

That the United Nations Convention on the Law of the Sea (UNCLOS), done at Montego Bay on 10 December 1982, contains relevant legal principles applying to fishing in areas under national jurisdiction and on the high seas;

The proposal presented within the framework of FAO's Committee on Fisheries during its meeting in April 1991 regarding the drafting of an International Code of Conduct for Responsible Fishing;

DECLARES

1. States[1], with a view to ensuring supply of fish products to feed present and future populations, should adopt effective fisheries planning and management standards which, within the context of sustainable development, will promote the maintenance of the quantity, quality, diversity and economic availability of fisheries resources;

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[1] For the purpose of this Declaration the term "State" should, where appropriate, be read as including the European Community.

2. States should take steps to improve management systems as part of the practice of responsible fishing. They recognize the principle of sustainable utilization of marine living resources as the basis for sound fisheries management policies. In this regard, they consider as one of the most important objectives the application of policies and measures which result in a level of fishing effort commensurate with the sustainable utilization of fisheries resources, taking into account the specific characteristics of particular fisheries;

3. States should improve scientific knowledge regarding the biology, abundance, distribution and fluctuation of fisheries resources, both in their own jurisdictions and on the high seas, taking into account geographic and climatic characteristics;

4. States should promote and enhance collection of data necessary for the conservation and sustainable utilization of fisheries resources;

5. States, in the design and subsequent introduction of new fishing gear and practices, should take into account qualified assessments of impacts on the sustainability of fisheries, giving due consideration to the specific characteristics and biodiversity of different fishing areas;

6. States should promote the development and use of selective fishing ear and practices that minimize waste of catch of target species and minimize by-catch of non-target species;

7. States should systematically assess the impacts of fishing, aquaculture and other activities affecting the marine environment, particularly in coastal areas;

8. States should take necessary measures to protect coastal wetlands and other areas of critical fisheries habitat from all kinds of degradation;

9. States should take measures to ensure respect for the interests of small-scale artisanal and indigenous fishers;

10. States should implement appropriate mechanisms to ensure responsible fishing in exclusive economic zones and other areas under national jurisdiction;

11. States should cooperate on bilateral, regional and multilateral levels to establish, reinforce and implement effective means and mechanisms to ensure responsible fishing on the high seas, in accordance with relevant provisions of UNCLOS;

12. The freedom of States to fish on the high seas must be balanced with the obligation to cooperate with other States to ensure conservation and rational management of the living resources, in accordance with relevant provisions of UNCLOS;

13. States should take effective action, consistent with international law, to deter reflagging of vessels as a means of avoiding compliance with applicable conservation and management rules for fishing activities on the high seas;

14. States should promote educational programmes and dissemination about knowledge about responsible fishing;

15. States recognize that environmental policies should deal with the root causes of environmental degradation, thus preventing environmental measures from resulting in unnecessary restrictions to trade. Trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade. Unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided. Environmental measures addressing international environmental problems should, as far as possible, be based on an international consensus. Domestic measures targeted

to achieve certain environmental objectives may need trade measures to render them effective. Should trade policy measures be found necessary for the enforcement of environmental policies, certain principles and rules should apply. These could include, inter alia: the principle of non-discrimination; the principle that the trade measure chosen should be the least trade-restrictive necessary to achieve the objectives; an obligation to ensure transparency in the use of trade measures related to the environment and to provide adequate notification of national regulations; and the need to give consideration to the special conditions and developmental requirements of developing countries as they move towards internationally agreed environmental objectives;

16. States, to promote the objectives of responsible fishing, should foster International cooperation in the development of effective mechanisms for joint research, information exchange and transfer of relevant technology and know-how;

17. International cooperation should include the financial support required by developing countries to enhance their capacity to exercise their sovereign rights by improving their systems for marine scientific research and fisheries management, including surveillance and enforcement;

18. States should enhance international cooperation to prevent illicit fishing that constitutes an obstacle to achieving responsible fishing objectives;

19. International cooperation in responsible fishing should also take the shape of greater financial support for investments by developing countries, channelled through existing international and regional financial organizations, association mechanisms and other forms of cooperation. The goals of that support should be to improve and broaden fishing activity, consistent with responsible fishing, ranging from capture and fish farming to processes incorporating added value to products destined for domestic consumption and international trade;

20. The implementation of the foregoing principles should be consistent with the sovereign rights, jurisdiction and duties of coastal States within their exclusive economic zones and other areas under national jurisdiction;

AGREES

I. To call upon the Food and Agriculture Organization of the United Nations to draft, in consultation with relevant international organizations, an International Code of Conduct for Responsible Fishing, taking into account this Declaration;

II. To recommend to the United Nations that the next ten years be declared the Decade of Responsible Fishing;

III. To promote, within the legal framework provided by the UNCLOS, effective international cooperation towards the achievement of rational and sustainable management and conservation of the living resources of the high seas;

IV. To call upon States to resolve as soon as possible the differences which still exist on the proposal made at the Fourth Session of the Preparatory Committee for UNCED to convene an intergovernmental conference on high seas fisheries;

V. That tariff and non-tariff barriers affect international trade in fish products and rational utilization of fisheries resources and that, in this regard, there is a need to reach agreement on measures to promote international trade in fish products consistent with the negotiations taking place in the Uruguay Round of the GATT, general principles of the GATT and the principles of responsible fishing;

VI. To request the Government of Mexico to convey this Declaration to the Secretary-General of the United Nations, the Director-General of the Food and Agriculture Organization of the United Nations and the Secretary-General of the United Nations Conference on Environment and Development.

ANNEX 3

UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT

EXTRACTS FROM CHAPTER 17

Protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas, and coastal areas and the protection, rational use and development of their living resources

C. Sustainable use and conservation of marine living resources of the high seas

Basis for action

17.47. Over the last decade, fisheries on the high seas have considerably expanded and currently represent approximately 5 per cent of total world landings. The provisions of the United Nations Convention on the Law of the Sea on the marine living resources of the high seas sets forth rights and obligations of States with respect to conservation and utilization of those resources.

17.48. However, management of high seas fisheries, including the adoption, monitoring and enforcement of effective conservation measures, is inadequate in many areas and some resources are overutilized. There are problems of unregulated fishing, overcapitalization, excessive fleet size, vessel reflagging to escape controls, insufficiently selective gear, unreliable databases and lack of sufficient cooperation between States. Action by States whose nationals and vessels fish on the high seas, as well as cooperation at the bilateral, subregional, regional and global levels, is essential particularly for highly migratory species and straddling stocks. Such action and cooperation should address inadequacies in fishing practices, as well as in biological knowledge, fisheries statistics and improvement of systems for handling data. Emphasis should also be on multi-species management and other approaches that take into account the relationships among species, especially in addressing depleted species, but also in identifying the potential of underutilized or unutilized populations.

Objectives

17.49. States commit themselves to the conservation and sustainable use of marine living resources on the high seas. To this end it is necessary to:

(a) Develop and increase the potential of marine living resources to meet human nutritional needs, as well as social, economic and development goals;

(b) Maintain or restore populations of marine species at levels that can produce the maximum sustainable yield as qualified by relevant environmental and economic factors, taking into consideration relationships among species;

(c) Promote the development and use of selective fishing gear and practices that minimize waste in the catch of target species and minimize by-catch of non-target species;

(d) Ensure effective monitoring and enforcement with respect to fishing activities;

(e) Protect and restore endangered marine species;

(f) Preserve habitats and other ecologically sensitive areas;

(g) Promote scientific research with respect to the marine living resources in the high seas.

17.50. Nothing in paragraph 17.49 above restricts the right of a State or the competence of an international organization, as appropriate, to prohibit, limit or regulate the exploitation of marine mammals on the high seas more strictly than provided for in that paragraph. States shall cooperate with a view to the conservation of marine mammals and, in the case of cetaceans, shall in particular work through the appropriate international organizations for their conservation, management and study.

17.51. The ability of developing countries to fulfil the above objectives is dependent upon their capabilities, including the financial, scientific and technological means at their disposal. Adequate financial, scientific and technological cooperation should be provided to support action by them to implement these objectives.

Activities

(a) Management-related activities

17.52. States should take effective action, including bilateral and multilateral cooperation, where appropriate at the subregional, regional and global levels, to ensure that high seas fisheries are managed in accordance with the provisions of the United Nations Convention on the Law of the Sea. In particular, they should:

(a) Give full effect to these provisions with regard to fisheries populations whose ranges lie both within and beyond exclusive economic zones (straddling stocks);

(b) Give full effect to these provisions with regard to highly migratory species;

(c) Negotiate, where appropriate, international agreements for the effective management and conservation of fishery stocks;

(d) Define and identify appropriate management units.

(e) States should convene, as soon as possible, an intergovernmental conference under United Nations auspices, taking into account relevant activities at the subregional, regional and global levels, with a view to promoting effective implementation of the provisions of the United Nations Convention on the Law of the Sea on straddling fish stocks and highly migratory fish stocks. The conference, drawing, inter alia, on scientific and technical studies by FAO, should identify and assess existing problems related to the conservation and management of such fish stocks, and consider means of improving cooperation on fisheries among States, and formulate appropriate recommendations. The work and the results of the conference should be fully consistent with the provisions of the United Nations Convention on the Law of the Sea, in particular the rights and obligations of coastal States and States fishing on the high seas.

17.53. States should ensure that fishing activities by vessels flying their flags on the high seas take place in a manner so as to minimize incidental catch.

17.54. States should take effective action, consistent with international law, to monitor and control fishing activities by vessels flying their flags on the high seas to ensure compliance with applicable conservation and management rules, including full, detailed, accurate and timely reporting of catches and effort.

17.55. States should take effective action, consistent with international law, to deter reflagging of vessels by their nationals as a means of avoiding compliance with applicable conservation and management rules for fishing activities on the high seas.

17.56. States should prohibit dynamiting, poisoning and other comparable destructive fishing practices.

17.57. States should fully implement General Assembly resolution 46/215 on large-scale pelagic drift-net fishing.

17.58. States should take measures to increase the availability of marine living resources as human food by reducing wastage, post-harvest losses and discards, and improving techniques of processing, distribution and transportation.

(b) Data and information

17.59. States, with the support of international organizations, whether subregional, regional or global, as appropriate, should cooperate to:

(a) Promote enhanced collection of data necessary for the conservation and sustainable use of the marine living resources of the high seas;

(b) Exchange on a regular basis up-to-date data and information adequate for fisheries assessment;

(c) Develop and share analytical and predictive tools, such as stock assessment and bioeconomic models;

(d) Establish or expand appropriate monitoring and assessment programmes.

(c) International and regional cooperation and coordination

17.60. States, through bilateral and multilateral cooperation and within the framework of subregional and regional fisheries bodies, as appropriate, and with the support of other international intergovernmental agencies, should assess high seas resource potentials and develop profiles of all stocks (target and non-target).

17.61. States should, where and as appropriate, ensure adequate coordination and cooperation in enclosed and semi-enclosed seas and between subregional, regional and global intergovernmental fisheries bodies.

17.62. Effective cooperation within existing subregional, regional or global fisheries bodies should be encouraged. Where such organizations do not exist, States should, as appropriate, cooperate to establish such organizations.

17.63. States with an interest in a high seas fishery regulated by an existing subregional and/or regional high seas fisheries organization of which they are not members should be encouraged to join that organization, where appropriate.

17.64. States recognize:

(a) The responsibility of the International Whaling Commission for the conservation and management of whale stocks and the regulation of whaling pursuant to the 1946 International Convention for the Regulation of Whaling;

(b) The work of the International Whaling Commission Scientific Committee in carrying out studies of large whales in particular, as well as of other cetaceans;

(c) The work of other organizations, such as the Inter-American Tropical Tuna Commission and the Agreement on Small Cetaceans in the Baltic and North Sea under the Bonn Convention, in the conservation, management and study of cetaceans and other marine mammals.

17.65. States should cooperate for the conservation, management and study of cetaceans.

Means of implementation

(a) Financing and cost evaluation

17.66. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about $12 million from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, *inter alia*, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

17.67. States, with the support of relevant international organizations, where necessary, should develop collaborative technical and research programmes to improve understanding of the life cycles and migrations of species found on the high seas, including identifying critical areas and life stages.

17.68. States, with the support of relevant international organizations, whether subregional, regional or global, as appropriate, should:

(a) Develop databases on the high seas marine living resources and fisheries;

(b) Collect and correlate marine environmental data with high seas marine living resources data, including the impacts of regional and global changes brought about by natural causes and by human activities;

(c) Cooperate in coordinating research programmes to provide the knowledge necessary to manage high seas resources.

(c) Human resources development

17.69. Human resources development at the national level should be targeted at both development and management of high seas resources, including training in high seas fishing techniques and in high seas resource assessment, strengthening cadres of personnel to deal with high seas resource management and conservation and related environmental issues, and training observers and inspectors to be placed on fishing vessels.

(d) Capacity-building

17.70. States, with the support, where appropriate, of relevant international organizations, whether subregional, regional or global, should cooperate to develop or upgrade systems and institutional structures for monitoring, control and surveillance, as well as the research capacity for assessment of marine living resource populations.

17.71. Special support, including cooperation among States, will be needed to enhance the capacities of developing countries in the areas of data and information, scientific and technological means, and human resource development in order to participate effectively in the conservation and sustainable utilization of high seas marine living resources.
